PULP & PAPER

1960 WORLD REVIEW

Global Production Is Up

Paper: 77 million tons

Pulp: 60 million tons

International Market Pulp Directory

438 LBS. OF PAPER PER PERSON . . .

U.S.A. annual consumption reaches peak in 1959, will top 440 lbs. in 1960 as industry heads toward another record year of 35 to 36 million tons

BOLTON *Microlyzed* JORDAN FILLINGS ARE

FIRST IN SALES!

BECAUSE BOLTON WAS —

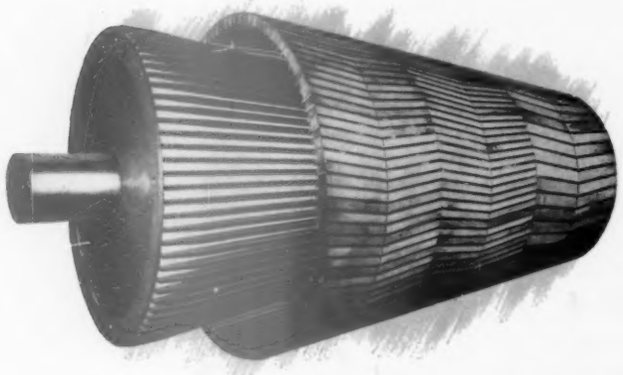
FIRST to develop special metals for fillings
FIRST to install complete in-plant heat treating facilities
FIRST to install instrument controlled wood drying kilns
FIRST to install dynamic balancing of filled plugs as standard procedure
FIRST to install and use electronic equipment to inspect knives
FIRST to hardness test each bar in every filling
FIRST to import and use Bethabara for wood separators
FIRST to introduce Microlyzed custom processing

There is no substitute for experience

It takes more than metal and wood to make a Jordan filling. The kind of metal selected and the way it is processed make a world of difference. The same is true of wood separators and the assembly of the knives and woods.

What matters most is *performance*. That is why Bolton Microlyzed Fillings should always be your first choice. It is with most papermakers.

With Microlyzed fillings you can rely on uniform, effective stock treatment every time. You will find them equal to any refining requirements with more to spare. Microlyzed fillings give long periods of even, uniform wear from every knife in the set, with the proper balance of wear resistance and toughness. Wear between plug and shell knives can be equally balanced.



There is no substitute for Quality

It takes a variety of specialized, highly developed skills to make fillings that out-perform all others. For instance, the photomicrostructural analysis of all raw stock and destructive mechanical properties testing determine exact heat treating requirements. Quality control serves as a double check in meeting established standards through every step of custom processing. Finally, non-destructive tests guarantee that these high standards of quality are present in every set of fillings before shipping — palletized, or in reinforced, sealed, corrugated cartons.

Bolton Microlyzed Fillings are available for every size and make of Jordan currently in use. Included are Wedgeless, Ring Type, Hydro-truss, Hydroflex, Boltobar and others of special design. Our Technical Advisory Service will gladly help you select fillings for your particular requirements.

Microlyzed fillings are unequalled for balanced refining, economy of long life, uniformity, strength, wear resistance and the ease of stripping and refilling — more reason why Microlyzed fillings are *first in sales*.

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TRADE MARK

John W. Bolton & Sons, Inc. and The Emerson Manufacturing Company, Division
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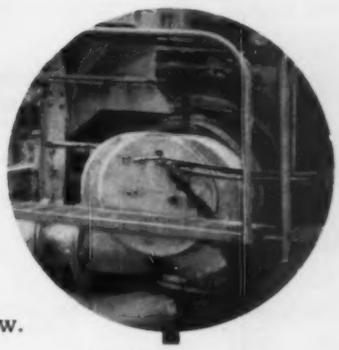

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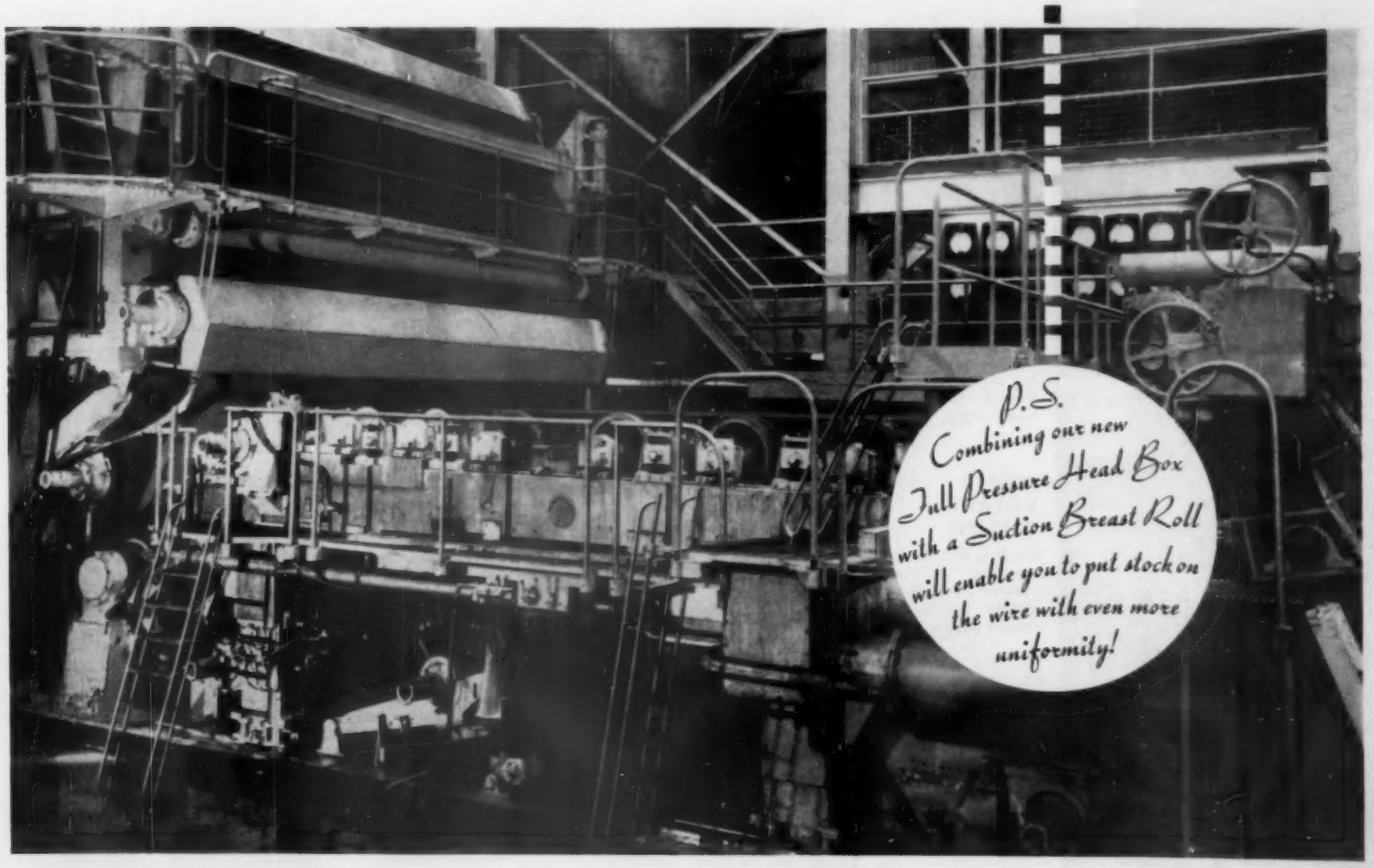
P.S.
Combining our new Full Pressure Head Box with a Suction Breast Roll will enable you to put stock on the wire with even more uniformity!

Model 14

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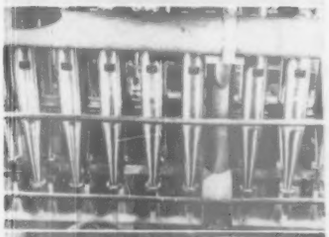
now built in three sizes, for super-efficient pressure screening of large or small volumes of stock at low overall cost per ton.

Model 10

Model 6



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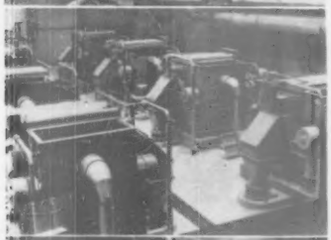

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for handling big volumes of stock through slotted plates at high consistencies in small space.

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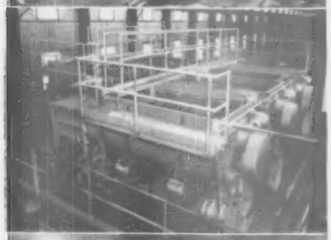
for high capacity, high efficiency knotting and perforate plate screening of pulp, building board, straw and waste stocks.



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of machinery that helps you make better, cleaner, more uniform pulp and paper, more of it per day at lower cost per ton, fewer rejects, breaks and shutdowns

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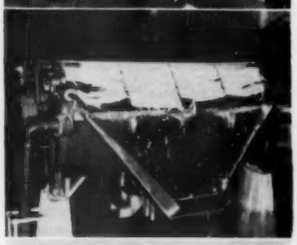

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for keeping cylinder machine top and bottom felt continuously clean, maintaining machine speed and reducing downtime.

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for maintenance of constantly clean, smooth roll surfaces, in twelve different designs, engineered for every roll.

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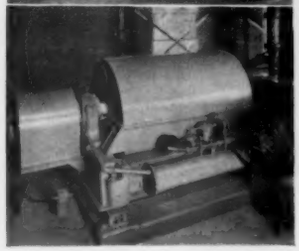
BIRD LIME MUD FILTERS

for delivering uniformly dewatered feed to the kiln, thus improving kiln operation and economy.



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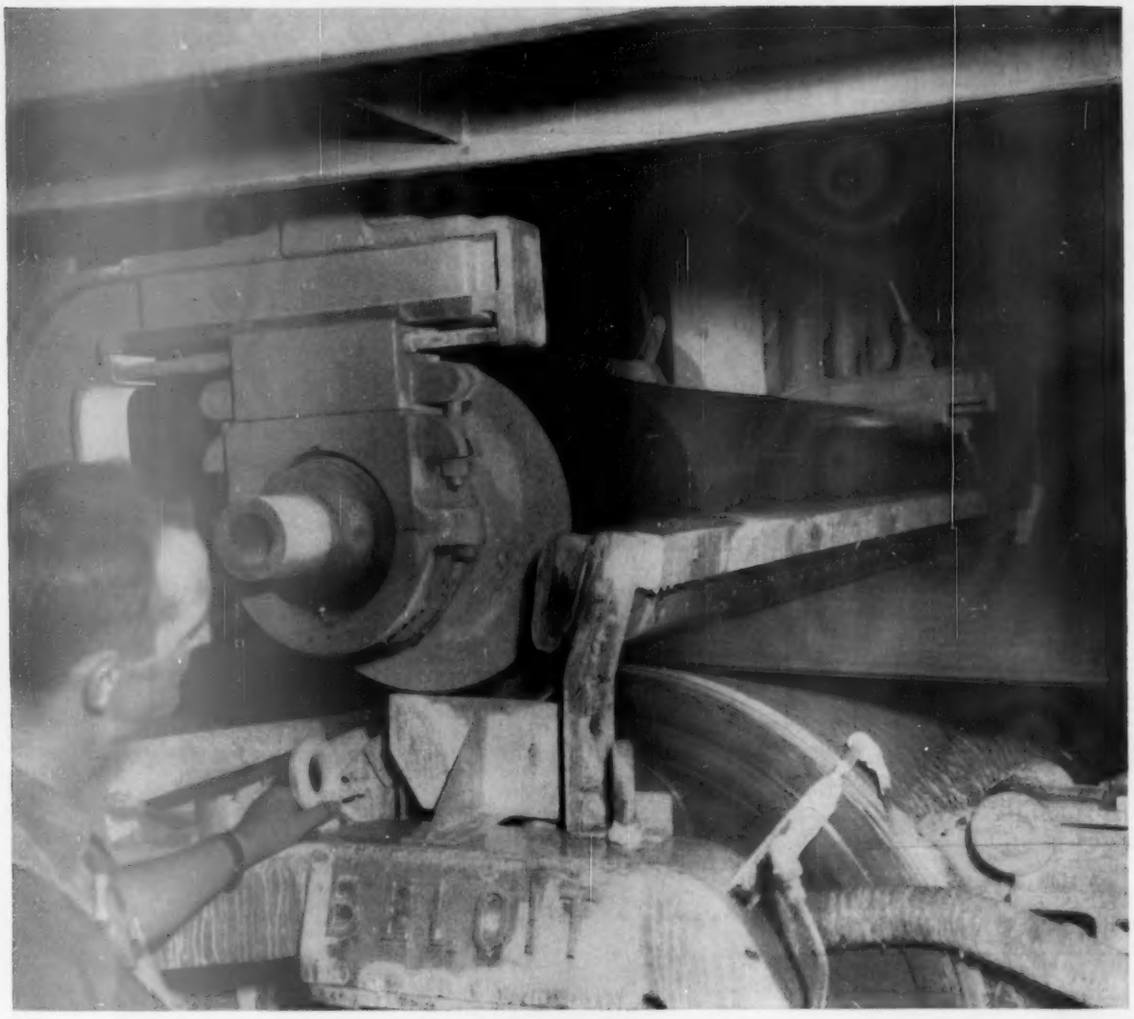
OUR COVER SHOWS just a portion of the almost one ton of paper which the average U.S. family uses in one year. We thank West Virginia Pulp and Paper Co. for permission to use this picture from their annual report.



Removes water efficiently without crushing

Another paper mill that's getting longer service, better paper formation with B.F.Goodrich couch rolls

THE covers of B.F.Goodrich couch rolls are made of a special rubber, tough enough to stand years of use, yet soft so the rolls couch perfectly without causing any crush marks. The result, of course, is smoother, more uniform paper formation.

In addition to better performance, B.F.Goodrich couch rolls have many cost-saving advantages. There's no danger of rust spots staining the felt or sheet because the ends of the rolls are sealed against moisture. This special end seal also reduces edge checking and cracking, so B.F.Goodrich rolls do not need to be reground as frequently as other rolls.

Cover separation is impossible because the rubber is locked to the steel roll by the exclusive B.F.Goodrich Vulcalock process, the strongest rubber-to-steel adhesion that is known today.

Shown above is just one of the many B.F.Goodrich couch rolls in use at Michigan Carton Company, Battle Creek, Michigan. Some of these BFG rolls are now in their twelfth year of trouble-free service at this mill.

Let a B.F.Goodrich representative show you how longer-lasting paper mill rolls can improve the quality of your paper and save you money. *B.F.Goodrich Industrial Products Co., Dept. M-856, Akron 18, Ohio.*

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RUBBER-COVERED ROLLS

World Growth of Paper

proceeds everywhere, especially in Europe, despite political tensions and collapse of Summit

By ALBERT W. WILSON
Editor, PULP & PAPER and PULP & PAPER INTERNATIONAL

• After traveling for several weeks in the Common Market countries of Europe, one big and important fact is abundantly clear as regards the paper industry. There may be tensions in diplomatic and military bureaus as a result of the collapse of the Summit meeting in Paris, but nothing of the sort is to be found in the pulp and paper industry.

The rapid growth of this industry, in Europe and in many other lands, is proceeding just as though nothing happened in Paris. The confidence of industry leaders quite obviously has not been shaken in any degree by the bitter events which have for this year, at least, put an end to high level personal diplomacy.

Political tension and cold wars on the diplomatic level seem to have become a way of life. But even *after* Mr. Khrushchev told Mr. Eisenhower he would not be welcome in Russia, this writer received two separate invitations from top commissars or officials of the Russian forest and paper industry, cordially inviting him to Moscow and Leningrad and to inspect Russian mills.

With the political upheavals and pressures all around us, it seems strange, indeed, that there should be a continuing steady rise in paper production and consumption throughout the world. Unfortunately, propaganda wars also require paper and more and more of it.

For the first time in history, worldwide production of paper and paperboard broke past the 70 million tons mark in 1959. It now pushes onward to what will be a new all-time record for 1960 and there is every indication that 1961 will be even a greater year for paper and paperboard.

In Europe, the leading companies are watching America and wondering if there are any signs of a recession, which they say, would inevitably bring one to Europe, too. They are pleased that American industry leaders see their growth as sound and with no present signs of any setbacks.

In the year 1953, when this publication first began this unique service of amassing worldwide industry statistics, the total world production was 50,476,381 tons. That was an historical event, too, because it was the first time *complete* world statistics had been gathered by anyone for this industry.

This annual worldwide search for latest statistics is the only undertaking of its kind on such a complete worldwide scale, bringing together data on paper consumption in about 100 nations and territories, from the Western World, the Communist World and all the "worlds" in between. From 70 of those nations and territories come statistics on production, as well as information on new mills and machines and other developments.

The credit for this unusual undertaking goes in full measure to our very fine staff of editors, men of high standing and authority in the industries of their own countries. It is gratifying to know that each of them takes special pride in performing this unusual service for the pulp and paper industries of the world.

Every year since this survey began in 1953, the world's paper and board production has risen—more than 20 million tons in seven years. In 1958 there were scattered declines in Canada, Britain, Norway, Austria, etc., but increases in the great majority of nations created a slight rise in production, even in that "partial-recession" year. Then in 1959, despite a slow start in most countries, all the nations swept forward. When you read the reports in this Review Number from the individual countries you will quickly see that even a greater increase is developing for 1960.

In the world of woodpulp there has been an over-capacity and only this year is the gap being substantially closed, due to a remarkably swift rise in demand in Europe (see Pulp Review, in this issue). In the pulp production statistics shown on these pages, straw, bagasse, esparto, bamboo and reed or grass pulps as well as those made with woods are combined, and the figures, of course, include the integrated pulp production as well as market pulp. The trend to more integration—removing more and more pulp from the market, to be used by the manufacturer in his own paper or other converting plants—has been apparent for at least ten years, but in 1959-60 it became even more widespread. It is one of the most important trends to watch in this industry.

Because of the over-supply, total pulp production of the world slipped backward slightly in 1958. Of major producers in that year, only Finland, Russia and West Germany showed small increases. In 1959, however, total pulp production again rose to

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new records in all parts of the world. It will be noted in the reports from our national editors in many nations, that 1960 will see another new high record set for pulp production.

What does this all mean? Standards of living are rising everywhere. Paper, which is used more than any other commodity except water, must be produced in ever-increasing quantities to make possible this progress. Strong nationalistic movements are developing at a terrific momentum in Africa, Asia and other remote lands. These people are demanding a better life and to achieve this, they must have paper. Revolutions, some of them peaceful, and some not so peaceful, plebiscites. etc., are in the news every day. Thanks to paper, these great changes are taking place with little bloodshed. Paper is more important to the Nehrus, Nassers and Nkrumahs of the world than armies. And with a great national election in the United States, this year, the consumption of paper will increase mightily.

Here are the basic figures for the year 1959:

Total world population
2,852,000,000
Per capita paper consumption
54.42 lbs.
World paper and board production
77,603,343 short tons
World pulp production (wood, straw, bagasse, bamboo, etc.)
60,403,161 short tons

Hard Facts About Industry's Future

Here are basic facts of which this industry should be cognizant:

1. The worldwide demand for paper and paperboard and pulps will double by 1975. (Incidentally, our observation over the past 20 years is that nearly all the experts' forecasts have fallen short of the actual growth pace!)

2. The potential demand for 2000 A.D. is simply astounding. The sheer push of rapid population growth will be the most powerful force in creating a much greater market for cellulose products of all kinds.

3. The coniferous softwoods of the world cannot possibly meet this increasing demand. More and more, the broad-leafed fast-growing trees and other fibrous growths must be utilized. Each country must develop the raw material it has in greatest quantity. Ultimately, the technicians will find ways to make equally good products from all these fibers, or mixtures of fibers.

4. The pulp and paper industry must be ever alert to competitors—aluminum, plastics, etc. Forward-looking companies are entering these fields, making combination paper-plastic products, for example. Where pulp or paper loses one market it may gain another.

5. Forests must be grown more scientifically. The silviculturist and the paper mill technician must know each other—and cooperate—to grow superior trees. Scientists must learn more about utilizing sugar cane bagasse, bamboo and conserve for paper use many other fibers now wasted.

6. Water supply to meet the needs of the "exploding" world population is a matter of increasing concern. Pulp and paper companies are under strong government pressures to clean up the water they use, in the United States, West Germany and other countries of Europe especially. The requirements for water for all purposes will easily more than double in 15 years. Water will have to be used and re-used many times. This is a science of the future—of great importance to the world's needs and its happiness—and a golden opportunity for the young engineer looking for a specialty. In the U.S.A., for example, pulp and paper mills now use about 6% of total water use in that country. But while this industry is a thirsty user of water, much like the aluminum industry, it should be recognized as a conserver of water, too, because of its cultivation of great forests. In many areas of the world, the levels of underground water supply are lowering.

7. Marketing and distribution of paper products—this is also a great problem of the future facing this industry. Should the mills continue to be built in the forests or should the forests (in form of chips, wood pellets or slush) be brought to the mill? The high costs of transport of raw material and of product will bring about revolution. ry changes.

8. More complete use of wood or other fibrous materials is another development which will bring many new discoveries in the years ahead. Europe already has achieved much in this field. But elsewhere, big chemical companies and big paper companies may combine operations—to use that much discussed 50% of the tree which is still wasted in many mills.

The pace of growth in cellulose manufacturing of all kinds is going to be greater in Europe and other parts of the world in the years ahead than in the United States. If the world merely raises its consumption of paper by an average of only one pound per person a year (less than half a kilo per person), one million more tons of paper must be produced. Even the industry experts, in many cases, are likely to be very surprised by the extent of growth of paper consumption in many countries which have been backward in their development.

In Europe, a tremendous growth is taking place, aided and abetted by the new European Economic Community (the "Inner Six" nations) and the even newer European Free Trade Association (the "Outer Seven"). As this is written, preparations were made to bring Finland into the outer group, also, and governments are seeking ways to open trade avenues between the two groups and ultimately, to bring them together. Thus would be created, an economically united Europe to match in trading power the United States and Canada on one side and the Communist bloc on the other. A new Latin American Common Market and other similar efforts to lower trade barriers and stimulate commerce will be extremely important to the future of pulp and paper.

One result of this is the construction of mass production machines and mills—running weeks or even continuously on one paper grade. Where in the past the markets were restricted to one small country, the mills required small machines and also frequent changes of grades.

In 1959, some big gainers in per capita paper consumption in the world were notably (pounds used per person): U.S.A., from 405.6 in 1958 to 437.8; Denmark, 163 to 180; Finland, 131.7 to 159; Sweden, 222 to 232; Britain, 198 to 207; Australia, 156 to 170; West Germany, 145 to 156; Belgium, 119 to 132; Japan, 69.3 to 88.3; South Africa, 50 to 55; Hungary, 31 to 37; Central Africa Federation, 3 to 7; Thailand, 2.2 to 5.1; Turkey, 7 5 to 8 58, etc. Russia's modest increase was from 31.2 to 32.3. This Review Number presents the complete list of countries and territories—close to 100—with their latest 1959 per capita consumption figures.

About one-half the world's paper production and consumption is still within the United States. Until recent years it was more than half. In future years, it may be expected, the United States figures will drop gradually below the half-way mark—the decline will be steady, but will only mean that other nations are rising.

New Uses—In Europe and Elsewhere

In just these recent weeks, in traveling in Europe, I have been amazed by the evidences of increasing uses of paper—as compared to a year ago. Grades of paper which were not available in some locations are now commonly seen. The most progressive countries already have, to some extent, all the kinds of paper and paper uses which are enjoyed in America.

In some cases, surprisingly, they are making greater use of special papers—for example non-carbon duplicating.

The big increases are in better qualities of sanitary papers and tissues, also in wrapping papers, and there is a veritable boom under way

How Nations Rank in Per Capita Paper Consumption

Latest 1959 statistics for paper and paperboard gathered from 94 nations and territories

Copyrighted 1960

	Population (1959)	Per Capita Consumption in lbs. (1959)
1. United States	179,500,000	437.8
2. Canada	17,442,000	280
3. Sweden	7,460,000	232
4. Great Britain	51,985,000	207
5. Denmark	4,550,000	180
6. Australia	10,200,000	177
7. Switzerland	5,300,000	176
8. Norway	3,560,000	166
9. New Zealand	2,335,000	161
10. Finland	4,413,000	159
11. West Germany	54,016,000	156
12. Netherlands	11,173,000	137
13. Belgium	9,124,000	132.3
14. France	44,600,000	115
15. Iceland	174,000	113
16. Austria	7,050,000	88 66
17. Japan	92,970,000	88.3
18. East Germany	17,832,000	87
19. Ireland	2,853,000	87
20. Czechoslovakia	13,469,000	85
21. Cuba	6,466,000	73
22. Israel	2,100,000	61
23. South Africa	15,000,000	55
24. Italy	49,230,000	50.6
25. Uruguay	2,700,000	50
26. Argentina	20,255,700	49
27. Hong Kong	2,806,000	47.4
28. Rumania	18,059,000	38
29. Hungary	9,980,000	37.4
30. Poland	28,997,000	35
31. Russia	210,400,000	32.4
32. Mexico	32,000,000	31
33. Taiwan	10,499,541	28.2
34. Brazil	63,101,627	29
35. British Guiana	520,000	27
36. Spain	29,894,026	25 6
37. Colombia	13,652,000	25
38. Lebanon	1,650,000	23
39. Portugal	9,201,029	22
40. Panama	995,000	20.2
41. Cyprus	549,000	20
42. Yugoslavia	18,397,000	20
43. Chile	7,550,991	19
44. Greece	8,500,000	18
45. West Indies	3,800,000	17
46. Bulgaria	7,722,000	17
47. Costa Rica	1,149,537	14.2
48. Malaya-Singapore	8,278,000	13 7
49. Venezuela	6,320,000	13
50. Puerto Rico	2,336,000	12
51. Peru	10,213,000	11
52. Egypt	24,026,000	10
53. Turkey	26,000,000	8.58
54. Nicaragua	1,378,000	8.2
55. Philippines	24,000,000	8
56. Iraq	7,000,000	7.54
57. El Salvador	2,508,000	7.5
58. Ecuador	4,000,000	7
59. Algeria	9,531,000	7
60. Central African Fed.	8,100,000	7
61. Ceylon	8,700,000	6.1
62. Dominican Rep.	2,843,415	6
63. Morocco	10,225,000	6
64. Guatemala	3,600,000	6
65. Thailand	23,500,000	5 1
66. Tunisia	3,815,000	5
67. Libya	1,500,000	5
68. South Korea	22,655,000	5
69. Honduras	1,887,389	4.6
70. Iran	20,900,000	4.4
71. China	640,000,000	4
72. Haiti	3,500,000	4
73. Paraguay	1,677,000	4
74. Cambodia	4,900,000	4
75. Bolivia	3,311,000	4
76. Jordan	1,527,000	3.7
77. Dutch-French Guianas	279,000	3.5
78. Laos	2,600,000	3.5
79. Indonesia	86,900,000	3.2
80. Rep. of Vietnam	14,000,000	3.2
81. Portuguese Africa	11,404,000	2.5
82. Rep. of Congo	13,559,000	2.4
83. Burma	20,255,000	2.13
84. India	400,000,000	2 1
85. Nepal	9,000,000	2
86. North Korea	8,000,000	2
87. Pakistan	85,635,000	2
88. French West Africa	18,747,000	1.5
89. Sudan	10,400,000	1.3
90. Ghana	4,836,000	1.2
91. North Vietnam	13,000,000	1
92. Liberia	1,105,000	.5
93. Afghanistan	13,000,000	.5
94. Ethiopia	19,500,000	.5
World's Total	**2,852,000,000**	**54.42**

. . . Fluid Power news

REPORT NO. 12,103
"HYTAC"* SYSTEMS ON NEW PAPER MACHINE

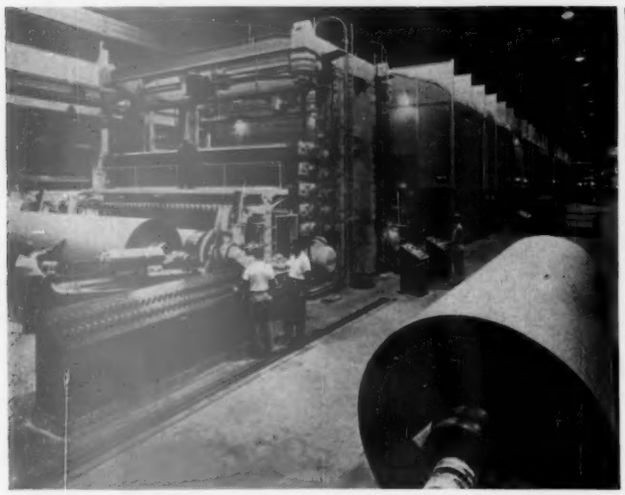
From Oilgear Application-Engineering Files

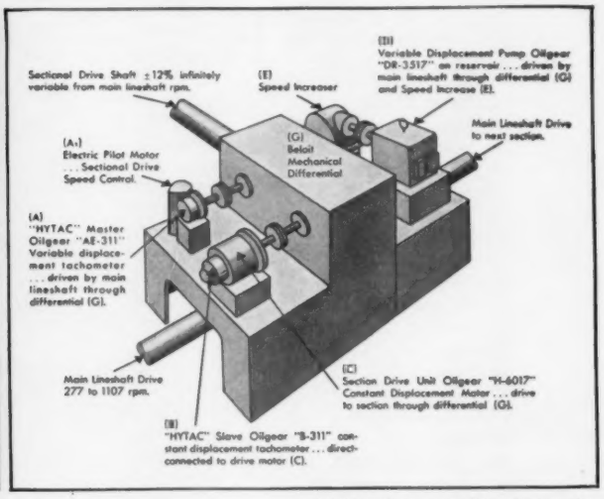
HOW OILGEAR "*ANY-SPEED*" DRIVES ON NEW PAPER MACHINE ACCURATELY CONTROL SECTION SPEEDS

USER: *West Virginia Pulp and Paper Company* (*Westvaco*) (*Builder—Beloit Iron Works, Beloit, Wisconsin*)

DATA: Systems to individually vary and accurately control speeds on four sections of a new, 264-in., $25,000,000 paper machine that will produce up to 225 tons daily of a revolutionary, patented, smooth, extensible kraft sheet. Machine is powered from a block-long main lineshaft with mechanical differentials at each section. Main lineshaft speed will vary over a 4:1 range—from 277 to 1107 rpm.

REQUIREMENTS: 1. A system that, when applied to each of four mechanical differentials, will provide individual, precision-controlled, infinitely variable increase or decrease of 10% over or under main lineshaft speed—as selected from 2 local, and 7 remote push-button stations. 2. Each system to maintain selected speed for its section within ±0.25% max. variation over a 50% load change at max. lineshaft speed. 3. Systems must also be: a. Compact. b. Impervious to moisture and daily high-pressure "wash-down." c. Thrifty on electrical power input. d. Trouble-free for continuous, heavy-duty, full-production paper machine drive service.



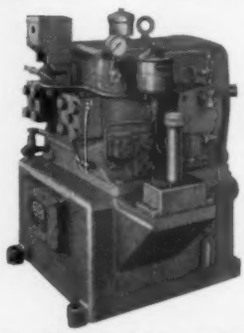

(D)
Variable Displacement Pump Oilgear "DR-3517" on reservoir . . . driven by main lineshaft through differential (G) and Speed Increase (E).
Sectional Drive Shaft ±12% infinitely variable from main lineshaft rpm.
(E)
Speed Increaser
Main Lineshaft Drive to next section.
(G)
Beloit Mechanical Differential
(A1)
Electric Pilot Motor . . . Sectional Drive Speed Control.
(A)
"HYTAC" Master Oilgear "AE-311" Variable displacement tachometer . . . driven by main lineshaft through differential (G).
Main Lineshaft Drive 277 to 1107 rpm.
(C)
Section Drive Unit Oilgear "M-6017" Constant Displacement Motor . . . drive to section through differential (G).
(B)
"HYTAC" Slave Oilgear "B-311" constant displacement tachometer . . . direct-connected to drive motor (C).

SOLUTION: *Application-Engineered* Oilgear *Hytac** (hydraulic tachometer) controlled drives provide precise, individual speed control on each of four sections—3rd dryer, 1st calender, 2nd calender, and winder reel of Westvaco's new #3 kraft machine shown above. Drawing, above right, shows components of typical sectional drive. *These highly accurate, compact, heavy-duty systems have met or exceeded all originally specified requirements.* Examples: 1. Specified ±10% infinitely variable sectional speed control range exceeded by providing ±12% in actual operation. 2. Selected speeds are maintained within specified limits *regardless* of load change. 3. Production speeds increased to over 2000 fpm. Important "Oilgear-plus" features are: 1. Dual winder control that, with the mere flip of a control panel switch, converts winder drive from speed-controlled to tension-controlled . . . speed control prevents tearing the tail strip when starting a new core, while tension control provides good roll quality at full sheet width. 2. Cushioned, controlled acceleration and deceleration. 3. Positive overload protection. 4. Pressure and flood lubrication with continuous power fluid filtration.

OPERATION: Fluid from master tach (A) gives section drive speed command to control on pump (D). Slave tach (B) feeds back a flow signal proportional to actual section drive speed. When main lineshaft speed is increased or decreased, fluid flow from master tach (A) automatically increases or decreases to command section drive to follow lineshaft speed change. Through local or remote pushbutton stations connected to electric pilot motor (A_1) on master tach (A), operator can increase or decrease speed of each *Hytac* section infinitely up to 12% of prevailing lineshaft speed.

A second Westvaco kraft machine will have an *Application-Engineered* Oilgear Controlled Motion System to cover a 10:1 lineshaft speed range, and a wider sectional speed range adjustment.

*"HYTAC" Systems—An Oilgear Trademark



Left: Oilgear Sectional Drive Pump (D) with integral reservoir. *Right:* Oilgear Sectional Drive Motor (C) with direct-connected *Hytac* slave (B) to left.

Fluid Power drives and controls were selected after three years of development on this process and machine—from a 2-in. table model, through a 15-in. laboratory model and 60-in. pilot model. Conventional variable speed drives could not provide the sectional speed control required. "*Equipped with the most advanced precision controls known to the industry . . .*"—is the statement Westvaco has made concerning their new #3 machine.

. . . for the lowest cost per year—it's Oilgear!

For similar practical solutions to YOUR linear or rotary Controlled-Motion problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY
Application-Engineered Controlled Motion Systems
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for linerboard and corrugating. Newsprint consumption is rapidly increasing and several big machines have been started up. Estimated world demand for newsprint in 1960 is 8% above 1959 but some countries still will have over-capacity.

The big newspapers are national newspapers in Europe, reaching every corner of a country on publication day. For this reason they are not likely to enjoy the considerable revenue that American papers have in department store advertising (the department stores can only hope to gain local trade, mainly, by newspaper advertising). This is a basic reason for the much larger size of American newspapers. But the total circulation figure of most European (and Japanese, too) newspapers far exceed those in America. Several of the former are in the 3 and 4 million circulation class.

Much of the very high consumption of paper in the U.S.A. is due to the very wide use of heavy fiber box containers. They add many pounds to the total. Europe is now entering this field and I have noted even machinery and many other unusual items now being shipped here in paperboard.

These facts testified to the assured growing importance of paper as an industry. If this were not enough, consider the wide range of cellulosic products, other than paper: Cellulosic plastics, cellophane, vulcanized fibers, rayon and acetate products. More and more countries are making dissolving or high alpha special pulps for this purpose and production is growing rapidly in Europe, Africa and elsewhere.

Besides U.S.A., Canada, Japan, Sweden, West Germany, Norway and Finland, there are several other countries making dissolving pulp. France and Turkey began in 1955 and South Africa in 1956, for example. Mexico started, then shifted the mill to paper pulp. World production of rayon-acetate increase by 300,000 tons to 2,750,000 tons in 1959, almost all made with woodpulp. Russia is a newcomer in the dissolving pulp field with a woodpulp plant to make rayon pulp for tire cord.

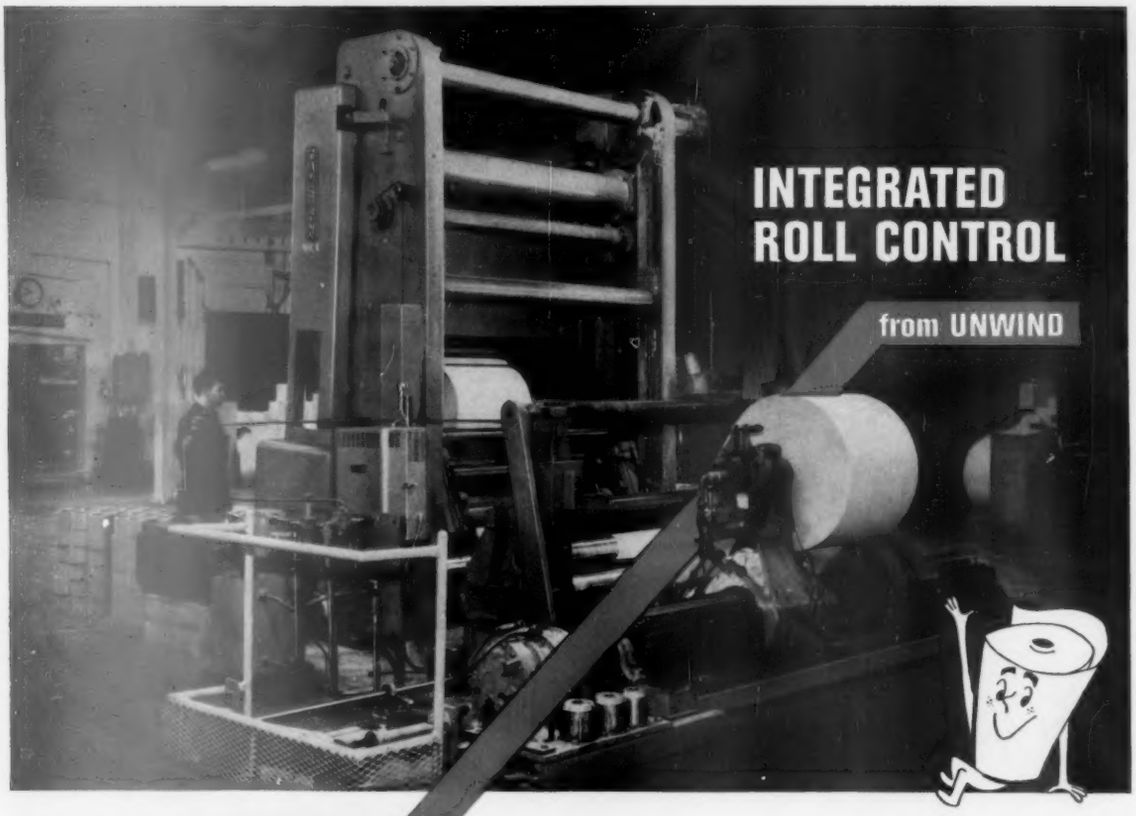
Consumption of paper and paperboard in the U.S.A. hit an all-time high record last year of close to 39,000,000 tons. All but 5,000,000 tons are made in U.S., and most of this comes from Canada for newsprint. Canada still has markets in almost every port of the world for its newsprint. As reports reveal in this Review, several countries have become self-sufficient in this particular paper grade, especially. U.S.A. consumption of paper is likely to reach 50,000,000 tons by 1970-but, as I have stated, growth in other countries, percentwise, will be even greater.

All Nations Producing Paper and Paperboard—How They Rank

Combined production figures for 70 producing nations in short tons of 2000 lbs.

Copyrighted 1960

	1957 (Short Tons)	1958 (Short Tons)	1959 (Short Tons)
1. United States	30,700,008	30,797,000	34,051,000
2. Canada	8,299,889	8,081,293	8,584,470
3. Japan	3,290,000	3,296,000	4,219,000
4. United Kingdom	3,711,875	3,922,746	4,094,912
5. West Germany	3,128,260	3,218,695	3,430,551
6. Russia	3,060,200	3,252,150	3,399,330
7. France	2,318,800	2,409,600	2,575,700
8. Sweden	1,853,000	1,857,000	2,054,000
9. Finland	1,712,000	1,750,000	1,881,000
10. China	1,144,000	1,259,000	1,630,000
11. Italy	1,167,239	1,207,554	1,392,000
12. Netherlands	970,676	977,587	1,047,347
13. East Germany	775,100	800,700	950,000e
14. Norway	709,815	708,459	787,368
15. Czechoslovakia	561,000	614,005	649,254e
16. Austria	577,075	572,676	589,721
17. Australia	444,192	473,000	513,000
18. Brazil	459,000	499,000	493,790
19. Poland	442,860	475,200	480,000
20. Switzerland	429,000	426,000	468,474
21. Mexico	357,000	400,000	420,000
22. Belgium	422,006	396,000	410,000
23. Argentina	297,000	361,090	380,930
24. Spain	310,200	335,000	374,000
25. India	235,341	305,000	327,040
26. Rumania	250,000	260,000	263,000
27. Yugoslavia	148,155	169,179	219,180
28. Union of S. Africa	150,000	150,000	202,570
29. Denmark	170,000	180,000	190,000
30. New Zealand	146,700	169,800	180,500
31. Cuba	102,000	161,000	180,000e
32. Hungary	108,900	120,897	136,298
33. Taiwan	74,720	101,341	126,323
34. Chile	64,485	78,301	102,955
35. Portugal	84,430	89,980	95,590
36. Ireland	70,900	84,000	89,600
37. Greece	53,000	60,000	75,000
38. Bulgaria	62,267	66,415	67,500e
39. Turkey	62,722	75,838	67,247
40. Peru	40,000	42,000	55,000e
41. Colombia	46,000	46,000	46,000
42. Egypt	23,000	44,000	46,000e
43. Pakistan	39,275	40,006	45,129
44. Uruguay	40,000	41,500	42,500e
45. Philippines	27,000	29,700	35,695
46. Israel	20,350	28,000	32,000
47. Puerto Rico	24,000	24,000	24,000
48. Venezuela	15,000	16,250	17,000e
49. South Korea	15,000	16,500	16,500e
50. Central African Fed.	7,000	7,000	7,500
51. Indonesia	5,000	5,000	5,000
52. North Korea	5,000	5,000	5,000e
53. Ceylon	1,518	1,669	4,696
54. Ecuador	3,600	4,000	4,000
55. Iran	3,000	3,410	3,500e
56. Costa Rica	3,000	3,000	3,000
57. Thailand	—	3,092	2,847
58. Guatemala	1,400	1,700	2,200
69. Libya	1,000	1,500	2,200
60. Vietnam	1,200	1,200	1,200
61. Lebanon	—	600	900
62. Bolivia	800	900	900
63. Rep. of Congo	—	550	650
64. Paraguay	450	450	450
65. Malaya and Singapore		300	300
66. Ethiopia	175	200	220
67. El Salvador	150	175	206
68. Dominican Republic	100	100	100
Total	**69,068,668**	**69,950,720**	**77,603,343**



Cameron 450. Refinements include vibration-free main drive transmission, dynamically balanced rotating elements, belt-driven riding roll, automatic counterweighting, friction-free rewind shaft bearing holders, electric riding roll lift*, automatic roll ejector*, and many other Cameron features.
*optional

How Fraser Paper Limited gets

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. . . the finished roll of superb quality, product of integrated roll control!

One of several Cameron integrated roll production systems serving in the Fraser mills and finishing rooms, this completely integrated 72-inch Cameron 450 rewinding system produces *The New Roll* in varying widths and diameters on stock ranging from 18-lb. waxing paper to 40-lb. bond. Unwind-to-rewind integration of *all* elements of this Cameron installation assures perfect control on every roll produced, at speeds better than 4000 fpm.

Roll control starts with a Cameron SMP-42 shaftless automatic pickup unwind equipped with two Cameron E-7 continuous duty unwind brakes. Actuating signals flash through the versatile Cameron 901 cam-controlled pneumatic web tensioning system, with electronic side-register control. Precision control is maintained right through to finished rolls on the Cameron 450, a heavy duty rewinder featuring exceptional speed and rewind capacity, easy console-operated built-in roll controls, and fast, easy set-ups with tight starts and firmly set cores.

The smooth dependability of Cameron *integrated roll control* pays off in high operating speeds and increased productivity . . . plus the superb quality of *The New Roll.*

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famous TIDLAND pneumatic shafts are sold exclusively through Cameron

54 years devoted exclusively to the design and manufacture of slitting, roll winding, unwind and web control equipment.

What is Soviet Russia's Industry Doing?

Soviet Russia is pushing ahead very rapidly and after my visit to the Soviet Union last year, I reported that it is determined eventually to catch up with other European countries and eventually the U.S.A. However, I reported that it would take at least ten years to catch up with the U.S.A., and just recently a leading official of the State Planning Commission for pulp and paper has said it would take 20 years. In actual production Russia is now in close competition behind the U.S.A. (far ahead in first place) and Canada (safely in second place for some years to come) for third position.

Russia, along with Britain, Japan, West Germany, France, Sweden, Finland; China and Italy are the other nations making from one to four million tons of paper a year. Russia, in sixth place last year, could possibly move to third place, behind U.S. and Canada, in a few years. But Sweden and Finland also will bear watching, as the new European market opportunities may persuade them to increase their integration and make more paper from their pulp. It should be noted that Russia is making paper for 200,000,000 people, twice as many as Japan and four times as many as either Britain, France or West Germany, so the Russian per capita consumption will surely lag well behind these other countries for some years to come.

One Russian leader, who headed a delegation to Canada, this year, said he would not live to see Russia become an important exporter of pulp or paper. But in the Russian economy, of course, it is possible to decide to sell considerable amounts of pulp or paper in selected world markets, despite the needs at home. European paper makers—and these are quite a few—tell me they will need this Russian pulp, generally of lesser quality, to fill out their furnish needs. For the past two years Russia exported at 217,000 tons each year of pulp, importing less than 70,000 tons each year. Paper exports are small, imports are greater.

In the special report direct from Moscow, which is published in this Review, it is stated that Russia's new 7-Year Plan resulted in production in 1959 of 2,326,500 tons of paper, 763,800 tons of paperboard and 2,186,000 tons of pulp. Over 1958, the paper increase was 90,000 tons, of board, 43,000, and of pulp, 93,000—steady but modest growth. But new capacities brough into production this year will total 300,000 tons of paper, 93,000 tons of board and 253,000 tons of pulp.

When in Russia last year, I was told by Vlas Nitchkov, who heads all exports of Russian wood products, that his country will continue indefinitely to export pulpwood, and eventually even hopes to ship wood to the U.S.A. via the Pacific route. But in European paper mills, I am told they find Russian wood prices high and they are seeking other sources—in many cases, their own, with the developing use of native hardwoods in France, Germany and Italy especially.

All Nations Producing Pulp and How They Rank

Production of wood, straw, bagasse, esparto, bamboo and other pulps in short tons of 2000 lbs.

Copyrighted 1960

	1957 (Short Tons)	1958 (Short Tons)	1959 (Short Tons)
1. United States	21,808,000	21,734,000	24,257,000
2. Canada	9,998,770	9,995,983	10,639,529
3. Sweden	4,667,000	4,494,000	4,845,000
4. Finland	3,371,000	3,375,000	3,495,000
5. Russia	3,100,500	3,218,600	3,362,920
6. Japan	2,735,107	2,614,786	3,314,935
7. West Germany	1,415,633	1,587,204	1,647,537
8. Norway	1,447,743	1,414,635	1,523,258
9. France	970,300	1,006,900	1,048,200
10. East Germany	635,800	707,300	715,000e
11. Czechoslovakia	540,000	627,687	685,844
12. Austria	647,188	641,086	654,229
13. Netherlands	541,000e	541,000e	551,000e
14. Italy	424,716	409,337	476,800
15. Poland	419,210	429,550	433,500
16. Brazil	235,000	266,000	293,000e
17. China	280,000	290,000	290,000e
18. New Zealand	234,600	263,400	277,100
19. Australia	218,400	219,500	235,200
20. Mexico	188,000	220,000	225,000
21. Switzerland	213,000	216,000	218,007
22. Rumania	200,000	210,000	212,000
23. Yugoslavia	152,956	163,080	177,900
24. Spain	163,900	147,800	172,000
25. United Kingdom	145,600	145,000	150,000e
26. Belgium	142,207	133,675	144,000
27. South Africa	95,000	95,000	111,000
28. Argentina	90,000	102,000	94,930
29. Portugal	56,024	65,780	76,560
30. India	59,360	70,800	72,800
31. Chile	26,053	50,902	56,881
32. Hungary	30,000	42,450	47,986
33. Turkey	39,343	47,908	43,166
34. Pakistan	33,678	37,023	36,527
35. Bulgaria	29,094	30,498	31,500e
36. Cuba	25,000	26,000	27,000e
37. Denmark	15,800	17,000	23,000
38. Peru	18,000	19,255	21,000e
39. Taiwan	23,191	13,015	20,388
40. Puerto Rico	12,000	12,000	12,000
41. Ireland	5,488	9,520	10,640
42. Uruguay	8,200	8,500	8,600e
43. Greece	8,000	8,000	—
44. South Korea	7,000	7,700	7,700e
45. Philippines	5,500	6,050	7,200
46. Ecuador	3,600	3,600	3,600e
47. Egypt	3,000	3,300	3,400e
48. Thailand	3,000	2,701	2,417
49. Guatemala	1,100	1,100	1,540
50. Ceylon	682	750	1,217
51. Malaya & Singapore	150	150	150
Total	**55,460,607**	**54,857,849**	**60,403,161**

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Here's your guide:

U. S. Uscolite® CP acrylonitrile-butadiene-styrene copolymer (ABS-I) pipe is best where maximum resistance to impact is demanded. It will safely handle most chemicals of industrial importance at working temperatures up to 170°F. This is the major plastic pipe used by chemical processing industries.

U. S. Uscolite RV polyvinyl chloride (PVC-I) pipe is best for extremely active oxidizing agents such as strong sulphuric, nitric and chromic acids. This unplasticized, unmodified Type I PVC has high impact strength and handles temperatures up to 140°F, far in excess of normal requirements.

Uscolite HT (ABS-II) pipe is a new addition to the resin-rubber compounds. HT stands for exceptionally High Tensile qualities, plus much better retention of physical properties at High Temperatures.

These types of Uscolite Pipe cover all requirements, not only because they are virtually immune to internal and external corrosion, but they are non-contaminating, odorless, impart no taste or discoloration. Because of these qualities they are approved by the National Sanitation Foundation for carrying drinking water. The use of Uscolite results in a saving of appreciable dollars in installation costs and reduction in man-hours. The skills to install metal pipe are not required to install Uscolite. Assembly can be accomplished in half the time. *Not one foot of Uscolite Pipe has ever failed in service when used in accordance with our recommendations.*

A fourth pipe, *UscoFlow HT (ABS-II)* is a black utility pipe, especially suitable where low first costs are a factor. It's a blend of styrene-base resin and synthetic rubber for good impact resistance and high tensile strength. UscoFlow is the ideal answer to builders and large developers who are seeking long-lived, maintenance-free pipe for plumbing.

We invite detailed inquiries or call your "U. S." plastics distributor. He has the *largest* line of plastic pipe and fittings, plus an experienced background to settle any and all questions about which pipe to use.

Mechanical Goods Division

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The Problems of Raw Material Supply

Throughout the world—but especially in the advanced countries—this industry is going to be increasingly competing for lands on which to grow forests. As the world population grows in great leaps, more land is in demand for growing food. Power dams, flood control projects, expansion of cities, military bases, superhighways, city watersheds, and recreational areas are continually taking away the land that would grow trees for industrial use. The only answer to this problem for the future is that there must be agreements for multiple use of such lands.

However, the Food and Agricultural Organization of the United Nations is optimistic—it predicts the world can produce two billion cubic meters of industrial wood each year, enough to meet its needs by 2000 A.D. In the past decade, the world's industrial wood requirements rose from just under 600 million to almost one billion cubic meters.

The FAO also reports world woodpulp consumption and production have increased at an average rate of 7% per year since 1948, but this would not have taken into account the slowdown of the past year or two. Most observers say in the past and in the future a normal and steady and wholesome growth of paper consumption has been and will be about 4% a year. But I am sure that in some European countries I have visited, twice this rate is likely to develop for some time to come.

Dr. Friedrich Dorn, the president of Zelstofffaprik Waldhof, Germany's biggest pulp and paper company, foresees a 50% increase in paper consumption in Europe by 1970—some 22 million metric tons over 1958. The German Ministry of Economics and some others foresee an even faster growth. Scandinavia will be the maior producer of the European pulp needs, but the U S A., Canada and Russia, to some extent, will support this growth.

Any intelligent review of the world situation today for this industry cannot overlook the increasing number of overseas ventures by various countries. The Common Market of Europe has been a powerful magnet. Many American companies—Scott, Kimberly-Clark, International Paper Co., Continental Can, Champion, Grace & Co., Olin-Mathieson, West Virginia Pulp and Paper Co., and others have made many investments, in many countries and often in some sort of a partnership with local leading pulp and paper companies. Bowaters, Reed and Wiggins Teape in Britain have likewise moved overseas, in an increasing number of locations. In Britain's case, these overseas moves are intended to diversify interests throughout the world, because the British expect increasing competition at home from Scandinavia in paper, due to the new "Outer Seven" Free Trade Association's lowering of duties July 1st.

In France, changes in company alignments and mergers of companies are so frequent they are difficult to keep track of. These are designed to achieve more efficiency and more profits within the Common Market. A result is the Franck Group, Béghin and Cellulose du Pin now emerge as producers of 30% of French paper and board, each making about 10%.

Kimberly-Clark of U.S. is in partnerships with Reed in England, Darblay in France and two cigaret paper companies in France, and has a joint operation with Aschaffenborg in Germany. Scott has moved into Britain, Mexico, Colombia, and in partnership with Bowater in Australia, in Belgium (with Papeteries de Belgiques) and in Italy with Burgo, which company makes 35% of all Italian paper.

Bowater has converting plants in Ghent, Genoa and Rheims and recently a highly important move was the acquisition of control of Paper Industries of St. Moritz, Swiss holding company which owns Cellulose de Strasbourg and Papeteries de la Chapelle in France, and others is involved in other industry ventures.

International Paper Co. has ties now in Germany and Italy. Reed of England has acquired a pulp company in Norway and packaging company in Australia. South Africa is the scene of new expanding combinations involving St. Regis of U.S., British and Italian firms. In Brazil, a half dozen outside companies are investing in pulp and paper production. And so it goes. Japan moved into Alaska, with U.S. interests as minority partners.

Major Developments

Sweden plans to increase its paper capacity by 55% and its market pulp capacity by 40% in the next three to five years. These percentages may later be altered, depending on European market trends. Prices are firming up and everyone in the pulp trade seems very contented with the developments in Europe.

In Finland, pulp expansion will be very great, totalling 1,250,000 tons by 1963, and two thirds of this will be in kraft pulp. It will bring this country's total capacity to about 3,-800,000 tons.

In France, paper and board consumption will rise 40% from 1961 to 1971 and another 40% from 1971 to 1981, according to the French ministry of Agriculture. It will need 2½ million more cords of wood or the equivalent of this in imported wood or pulp. France has made remarkable gains in exports of paper and board under the Common Market regime. Imports have dropped sharply.

The growth in other countries is the greatest in their history in many cases.

The growth in Japan has been amazing and our editor in that country says the FAO of the United Nations has greatly underestimated what Japan's production increases will be. This country is again reaching out for the export markets it lost in the war.

In India, the head of the paper industry says paper producing capacity must be tripled as rapidly as possible to meet the nation's needs. It aims for a capacity of 900,000 tons. Sixty small mills of only 5 to 10 ton capacity have been licensed within a six mouths period.

In Australia and New Zealand, many new machines have started up or been ordered in the past couple years. Here and in South Africa, growth of the industry is setting a dizzy pace. Obviously by their activities, machinery builders expect considerable activity in these regions and in Latin America over the next decade.

Mainland China and Taiwan, facing each other belligerently across a narrow strait, are both building up their papermaking industries. The Peiping Communist regime has been purchasing new machines in Europe. In other Communist countries, growth is continuing, as reported in these pages—for instance, Hungary plans production of 228,250 tons of paper by 1965, about a 60% increase. Yugoslavia has three new mills coming into production. Egypt, Greece, Turkey, Israel and others are setting up mills and machines.

It may truly be said, the sun will never set on new mills or new machines.

World Leaders Analyze

Commentaries on pulp and paper industry situation as they see it, written by outstanding leaders of major pulp and paper companies

Demand for Pulp is Sound, Consumption Slowly Rising, Says Finnish Leader

By WILLIAM LEHTINEN
President, Enso Gutzeit Oy

MR. LEHTININ, head of Finland's biggest pulp and paper industry and one of biggest in Europe, finds woodpulp in much better shape this year.

—Helsinki

● The present world pulp situation in general, as it appears today (in late spring of 1960):

1. I understand that the demand for pulp is on a sound basis. The consumption is slowly rising and ought to correspond to the increase in population and the higher living standard.

2. As far as I can see the supply of pulp is satisfactory and in balance with the demand, though some qualities may temporarily be scarce.

3. As a result of the reasons mentioned above in points 1 and 2 the price level has lately been rather firm. For the moment there is a tendency among the pulp producers to adjust the prices somewhat upwards. The reason for this is in the higher production costs as well as in the increased transport expenses, etc.

As it appears from the vantage point of Finland, this is the current situation in the pulp market. Of course there are countries that due to exchange, financial and other reasons are in a different position but these are exceptions.

Industry Activity is Very High and Britain Turns Attention Abroad for Coming Decade

SIR ERIC BOWATER in his report for the Review Number said that the industry ". . . moves into 1960's in good shape and good heart . . ."

By SIR ERIC BOWATER
Chairman of Bowater Organization

—London

● Great Britain's paper industry moves into the 1960's in good shape, and in good heart. The resurgence last year of North America from her recessionary phase was reflected in Britain's economy also, and the paper industry, like other major industries, is once again operating at a very satisfactory level. During 1959, the industry's total output of paper and board reached 3,611,000 tons—an increase of 6% over 1958, and a record for postwar years. There is encouraging evidence that this upward trend will continue.

Most classes of paper and board are sharing in this recovery. In newsprint, for example, which can generally be taken as one of the barometers of industrial activity as a whole, United Kingdom production rose from 627,000 tons in 1958 to 672,000 tons last year. Consumption of newsprint in Britain has in fact been rising steadily over the past five years, and now represents an increase of more than 22% over the 1955 level.

While demand for the industry's traditional products is thus maintaining its impetus, the use of its more modern products, particularly in the field of packaging, has in recent years expanded phenomenally. New applications, both for industrial and retail packaging, are continually being sought and found. With such developments as the rapid growth of self-service retailing, and latterly of automatic vending systems, all exerting their demands on the capacity of the packaging paper maker and converter, it can confidently be expected that this branch of the industry will be fully exercised in the years to come.

Domestic and industrial tissue products are another modern field in which, judging by North American experience, substantial increases in output can be looked for on this side of the Atlantic.

Developments Home and Abroad

In all fields, research and development are being most vigorously prosecuted. While the phase of capital expansion of production capacity within the industry in the United Kingdom is, for the time being, mostly completed, efforts are now being concentrated on the speeding-up and streamlining of existing plant, on new operational or managerial techniques, on improvement of products and services, and more efficient and economic use of resources. One important event of 1959 was the commissioning of Britain's second groundwood pulp mill, which is operating on home-produced timber.

At the same time, the industry is turning more attention to the outside

Outlook for this Review

world—not so much as exporters but as partners in local manufacturing enterprises, particularly in territories where industrialization is going steadily ahead—in the Commonwealth, for instance, as well as in the European Common Market area. By associating themselves with developments in countries having not only a great potential demand for paper but, increasingly, the means of satisfying that demand, leading British paper manufacturers are playing an active part in what is unquestionably, in a world context, one of the major growth industries.

MR. WHITAKER: ". . . for economy as a whole and for paper in particular, no imbalances are in evidence . . . buying for consumption . . ."

No Danger Signs in U.S.A. as Paper Sets a New High Record

By HOWARD E. WHITAKER
President,
American Paper and Pulp Assn.
Chairman, The Mead Corp.

—Dayton, Ohio

● In the American Paper and Pulp Association, we do not see any recession ahead and there are no danger signs for 1961, particularly. Of course, we know that there will be fluctuations in the future as in the past, and there is always over capacity in the "valleys." But in discussing capacity, it seems more realistic to consider capacity over ten year periods or longer periods. In the past decade, for example the paper industry of the United States has averaged operations at about 90% and that is good. In previous decades, it was around 80%.

We are not exactly in a boom, but for most paper grades things are going along very well. Maybe we should be happy that we are not in a boom and be pleased that growth is more steady.

We are not concerned about the fact that several new machines have been ordered recently in the U.S.A. The orders for machines are spread around the country pretty well, and are in different grades.

For the rest of 1960, we do not anticipate that very much paper will be bought for inventory purposes. Demand for paper for inventories may be expected to diminish. It will be bought for consumption and that is a good sign. There have been some price increases but these do not seem to have affected improvements in any way.

Woodpulp production was at an annual rate of 25 million tons for the first two months of 1960, up 9% from 1959. Market pulp showed a particularly strong gain.

As an association, the American industry has asked the United States government to take any steps necessary to safeguard the American industry against discrimination within the new European Common Market and the European Free Trade Association.

As for our future forest supply in North America, I am quite confident. The progress which has been made in forest management, and the potentials of the studies in genetics, indicate a greatly expanding yield of cellulose fiber in the future. The amazing development of hybrid corn and resulting improved yields is a proven result. We may see something quite similar in forestry development.

West German Paper Consumption Up 8%, Some Price Increases Must Be Expected

By DR. FRIEDRICH DORN
President,
Zellstofffabriken Waldhof

—Wiesbaden

● During the first months of 1959 the pulp and paper market in Europe remained rather weak and did not recover until the second quarter, thus lagging behind the U.S.A. market for more than half a year. In April 1959 prices for most qualities of pulp and paper had even to be reduced again following the price policy of the Scandinavian industries.

In spite of the dull beginning, the year as a whole proved at last to be the best postwar year with new peaks in production of paper pulp as well as of paper and board. Only dissolving pulp could not yet regain the rate of production reached in 1957.

Imports increased even more in percentage than production:

Increase 1958:1959	*Production*	*Imports*
Paper and Board	+ 7%	+23%
Chemical Pulp	+ 6%	+20%
Sulfite Paper	+ 4%	+12%
Sulfite Dissolving	+11%	+20%
Sulfate	–	+24%
Groundwood	+ 1%	+34%

DR. DORN: ". . . no reason for any fear if EFTA remains apart . . ." The company he heads is largest pulp and paper firm in West Germany.

Per capita consumption of paper and board was 8% higher than in 1958 and reached 71 kg. Nevertheless, it is still lower than in the Scandinavian countries, Great Britain, Switzerland and the Netherlands where the consumption rates have also increased considerably.

With order books being well filled for some weeks or even months to come, the year promises to become a good one, though it is not sure, if demand will continue at the present high level. In consequence of the

NEW IDEA IN MATERIAL HANDLING CUTS COSTS AT BIRD & SON, INC.

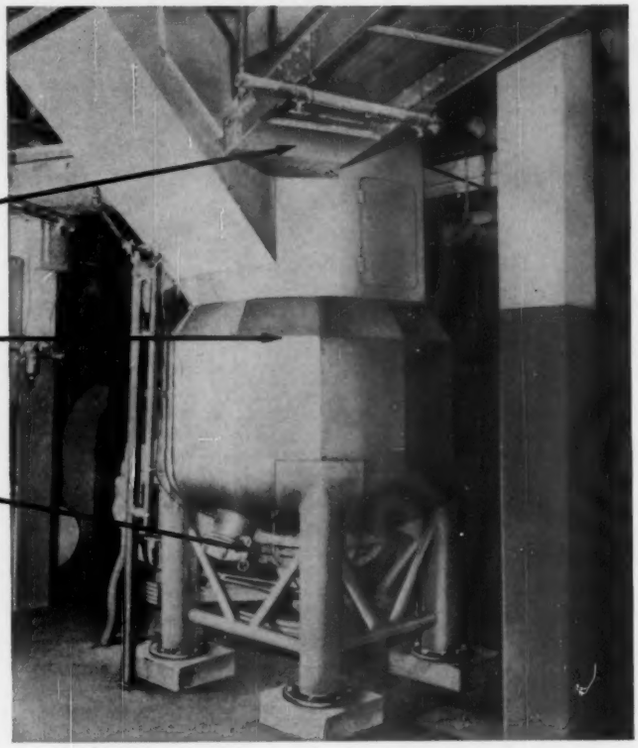
From
Converting Mill . . .

Via Conveyors

To Pulper

To Pump*

To Pulp Mill



With the Impco
Solvo® Pulper

The Model 2U Solvo Pulper, playing a dual roll at Bird & Son, Inc., East Walpole, Massachusetts, has sharply reduced previous material handling costs. It is operating continuously under automatic control as both a material handler and a pulper. Boxboard broke from the converting machines is delivered by conveyors to the Solvo which simultaneously pulps and pumps it to the pulp mill. The units' single 50 HP motor handles both pulping and pump-away demand at a 24 ton/day rate.

This is one of a wide variety of Solvo Pulper applications. Others include de-ink cooking, dry end broke handling, paper machine furnish pulping, transfer of high yield cooked chips to refiners as well as the normal pulping of broke, wet strength and waste paper. Units are available for any capacity requirement.

*The pulping element, extractor plate and stock pump are one rotating assembly.

IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE
In Canada: Sherbrooke, Machineries Limited, Sherbrooke, Quebec

pulpwood prices having been raised in Scandinavia as well as in Germany, price adjustments for pulp and paper must be envisaged.

The further steps which will be taken within the European Economic Community (Common Market) towards a tariff reduction in general will certainly have some influence on the business situation in the long run, but there is no reason for any fear in this respect as long as the countries of the European Free Trade Area remain apart.

DR. DE GRAAFF, who is head of Van Gelder Zonen N.V., one of Europe's biggest paper companies: ". . . further progress will be made this year . . ."

Dutch Industry Sets Record, Consumption Rises, Says Leader in Netherlands

By DR. F. H. A. DE GRAAFF
President of
Van Gelder Zonen N.V.
and President,
Dutch Paper Makers Assn.

—Amsterdam.

● The Dutch paper and board industry achieved a new production record in the past year. The total production excluding strawboard and strawpaper reached 652,847 short tons, surpassing the year 1958 by 12.6%.

The biggest increase took place in the sector of the production of wrapping- and packing-paper and -board (18%) whereas the production of newsprint made little progress, viz. 3.6%. Details are given below:

	(In Short Tons)	
Production	*1959*	*1958*
Newsprint	144,311	139,265
Other printing and writing paper: Wood-containing	70,800,	63,041
Wood-free	113,632	98,755
Packing and wrapping	285,317	241,731
Miscellaneous	38,787	36,827
Total	652,847	579,619

Imports of paper and board were up to 277,415 short tons, an increase of 19.8% regarding 1958, and export of these products achieved 152,841 short tons, or 12.6% above the 1958 level. Consumption of paper and board (excluding strawpaper and strawboard) rose from 678,697 short tons in 1958 to 777,424 short tons in last year, thus an increase of about 15%.

Consumption per capita is also rapidly increasing, viz from 121.3 lbs. in 1958 to 137 lbs. in 1959 (1950: 85).

The Dutch paper- and board industry comprises 36 firms with 41 mills, including some mills producing both paper or board and strawpaper and strawboard.

Production capacity (excluding the strawboard industry) has been estimated at about 715,000 short tons.

Considerable quantities of raw material must be imported, the Dutch pulp industry only producing mechanical woodpulp for the integrated production of newsprint and bleached strawpulp. Imports of chemical woodpulp reached some 227,000 short tons; the main suppliers were Scandinavia and Finland.

The recent economical situation justifies the assumption that further progress will be made in the current year.

Question Is Not If World Needs More Pulp and Paper—but When, and Where

By T. N. BEAUPRE
President,
Columbia Cellulose Co. Ltd.

MR. BEAUPRE, president of Columbia Cellulose Co., predicts Canada will play a growing part in filling world demand for pulp and paper.

—Montreal

● No one can predict with certainty the short term future which faces the Canadian industry in its relationship to the world picture, but there are signposts which may help to guide us in our long term thinking. When economic activity is on the increase in any world scene, there is usually a parallel surge in the demand for pulp and paper products. Although not at peak production based on the abnormal postwar period, the Canadian and U.S. economies are very active, and the European market is enjoying a rebirth through its groupings to reorganize economic boundaries.

For the long term we face a growing population in North America where a high demand per capita is already established. Growing literacy throughout the world—as well as a general economic awakening—speaks well for the future. The problem facing economic forecasters and those who must put the forecasts to use is not so much whether or not the world will require more pulp and paper production, but when and from what source.

The ability of the Canadian industry to meet future demands for high quality specialty grades, utility pulp grades and newsprint cannot be doubted. The combined resources of technical skills, prime timber reserves, bountiful power and water and a general economic stability, indicate that the Canadian industry will play a growing part in filling the world demand for pulp and paper requirements.

However, with a current excess of capacity, there is no guarantee that Canada will receive the next expenditures of investment capital. It is not assured that the Canadian resources presently in reserve will be the next to be developed, and the success of our efforts to increase efficiencies, control costs and taxes, and lead the way in technological research will be a key to the future of the Canadian industry in the next few years.

NO MORE MILLION-DOLLAR MEALS for this FELT PARASITE!

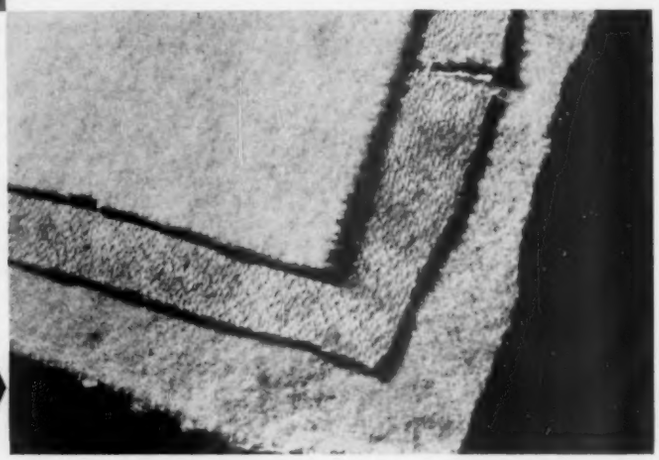
A single felt fiber, attacked by organisms which produce the condition commonly known as mildew, quickly grows the familiar molds which attack and soften fibers.

Mildew . . . the same fabric destroying growth that had Grandma airing out winter clothes and blankets a couple of times each summer . . . can damage a felt as surely as a misaligned roll or an excessively alkaline condition. Every year, especially during summer shutdowns, hundreds of thousands of dollars worth of otherwise-good felts are ruined by mildew, while inactive on the machine in a moist condition. This type of damage to paper-machine felts becomes evident when the felt rips off the machine almost at the instant of startup.

Such risks were endured as hazards of shutdown periods until a paper-maker checked into the problem with one of Lockport Felt's service representatives. Lockport Chemical Research people dug deeply into the whole matter of felt damage by micro-organisms. The facts they unearthed led to the development of another Lockport Treatment, which solved the customer's problem.

Costly mildew damage to stored or standby felts is now a thing of the past, thanks to progressive research by Lockport Felt Technicians.

Similar fibers in the same mold-producing environment, resist all mildew deterioration with the help of a Lockport Felt Treatment applied to the felt fibers.



Felt samples, exposed together to concentrated mildew-producing conditions, illustrate the protective efficiency of Lockport's new treatment. The treated sample at the top retains full strength and resilience. The others show complete fiber deterioration and loss of strength.

LOCKPORT Quality FELTS

LOCKPORT FELT COMPANY, Inc.

Serving the Papermakers Since 1891

NEWFANE, N. Y. **STARKVILLE, MISS.**

Swedish Paper Capacity Rise of 55%, Market Pulp 40%, Seen by 1963 to 1965

By EIJE MOSSBERG
President, Svenska Cellulosa AB

MR. MOSSBERG became president of SCA this year. He was a Swedish cabinet minister, later a provincial governor. He says: ". . . 1960 will allow satisfactory utilization of capacity . . ."

—Sundsvall

● To the Swedish pulp and paper industry, 1959 meant a gradual improvement of the market situation. The background to this was the favorable general economic development in Western Europe which during the last half of 1959 resulted in a high level of economic activity. An important contributing factor to the stabilization of the pulp and paper market was the production curtailments voluntarily undertaken by Scandinavian producers during 1959.

The price development has been unfavorable and resulted in price reductions for most pulp and paper qualities. A certain recovery has taken place during 1960 for unbleached sulfate and unbleached sulfite, but the price level must still be considered unsatisfactory, particularly when taking into consideration the gradual increase of labor and raw material costs.

2,000,000 More Tons of Pulp

At present, a considerable expansion is taking place within the Swedish pulp and paper industry. It is calculated that the total increase in pulp capacity between 1959 and 1963/1965 will amount to approximately 2 million metric tons, about 50% of which will be converted in integrated mills to paper and the balance will be sold as market pulp. The paper industry capacity will thus increase by about 55% and the market pulp capacity by about 40%.

Western Europe is the dominating market for the Swedish pulp and paper industry and it is expected that this market will take up most of the production from the new mills. Everything indicates that this will be the case, even if certain problems can be anticipated during a transition period.

Since during the unsuccessful negotiations concerning a free trade area for the whole of Western Europe the British and Continental paper industries expressed their fear of a future shortage of market pulp, it is important to call attention to the fact that the Swedish market pulp capacity will increase by approximately one million tons during the next few years.

The formation of the European Free Trade Association (the "Outer Seven" group of countries) has been greeted with satisfaction by the Swedish pulp and paper industry, since customs duties on paper and board, which now as a rule amount to 15-20%, will gradually be abolished among member countries. Any immediate and revolutionary change in the present commercial structure is unlikely to follow, but the Swedish industry sees a chance to increase, in the long run, its exports to the EFTA countries of such paper qualities as kraftliner and kraft paper, which can be produced in Sweden more economically.

An association between the EFTA and the Common Market countries of Europe is extremely desirable, both from a general viewpoint and from the point of view of the Swedish pulp and paper industry. This would permit a more rational utilization of all production resources, which would be of benefit to all member countries. Anyhow, the Swedish pulp and paper industry looks to the future with confidence. Western Europe's demand for pulp and paper is growing fast and will thus provide the Swedish industry with new outlets for its increased production.

French Progress in Printing Papers, But Otherwise Expansion Slows

By ANDRÉ LOURDELET
President, General Manager
S.A. Cartonneries
Lourdelet-Maricot

M. LOURDELET, president and general manager of S.A. Cartonneries Lourdelet-Maricot, says ". . . with the exception of the journal category, the French paper and cardboard industry has been practically at a standstill during 1959 . . ."

—Aubervilliers (Siene)

● In 1959 production of paper and cardboard by mills in continental France reached 2,575,700 short tons, representing an increase of 6.9% over 1958.

This increase, however, reflected mostly the substantial increase recorded by the type called "journal," covering the total deliveries made to the press, that is both the newsprint quality and the higher magazine qualities.

As a matter of fact, if we break down the said production increase into broad categories, we obtain the following:

"Journal" (newsprint and magazines)	+24%
Other printing and writing papers	+ 2.5%
Packing (wrapping) and cardboard	+ 2.2%
Thin papers and special grades	+3%

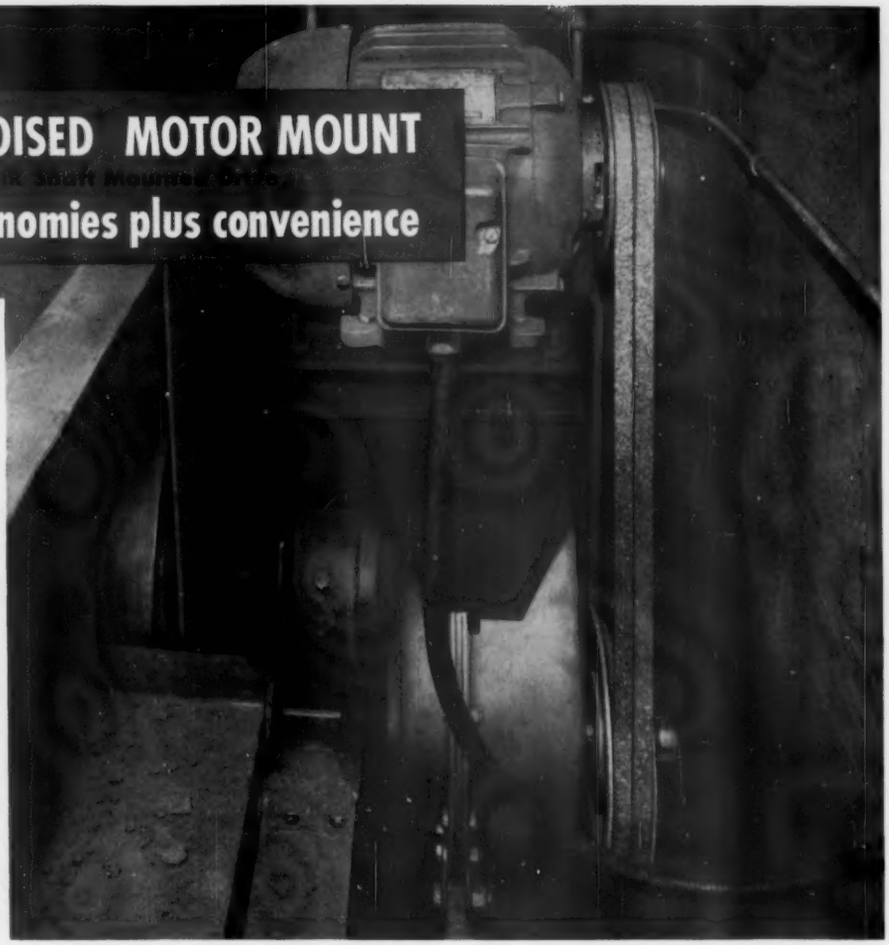
This substantial increase in the production of "journal" paper (newsprint and magazine papers) results from two new high-production machines.

For the first time, packing (wrapping) paper and cardboard have been combined in the same group, because changes in nomenclature between these two types, which are not clearly defined, would not permit valid comparisons with statistics of the previous year.

Finally, even though all other grades, outside of the "journal" (newsprint and magazine) papers, show also a slight increase in production, their

NEW FALK EQUI-POISED MOTOR MOUNT

gives unequaled economies plus convenience

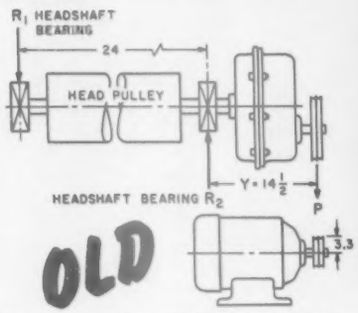


HOW A FALK EQUI-POISED MOTOR MOUNT REDUCES BEARING LOADS ON A DRIVEN MACHINE

GIVEN:
- Motor—15 hp, 1750 rpm, Frame 284U, Weight—320 lb.
- Sheave diameters—6.6/9.4
- Driven machine—belt conveyor with 24" center distance between headshaft bearings.

NOTE:
- Weights of 307J24 Shaft Mounted Drive, sheaves, and V-belts are eliminated from calculations because they remain constant; do not affect the comparison.

WITHOUT FALK MOTOR MOUNT



Torque at motor shaft = $\frac{63{,}025 \times 15 \text{ hp}}{1750 \text{ rpm}} = 540$ lb-in.

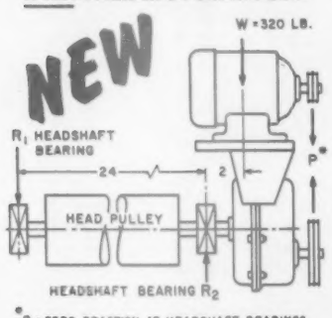
Belt pull (P) = $\frac{540 \text{ lb-in.}}{3.3''} \times 1.5$ Load Connection Factor = 246 lb

$R_2 = \frac{246 \text{ lb} \times (24'' + 14.5'')}{24''} = 395$ lb

$R_1 = \frac{246 \text{ lb} \times 14.5''}{24''} = 149$ lb

(Check: 395 lb—149 lb=246 lb)

WITH FALK MOTOR MOUNT



*P = ZERO REACTION AT HEADSHAFT BEARINGS

V-belt pull has zero reaction on headshaft bearings. Therefore—

$R_2 = \frac{320 \text{ lb} \times (24'' + 2'')}{24''} = 347$ lb

$R_1 = \frac{320 \text{ lb} \times 2''}{24''} = 27$ lb

(Check: 347 lb—27 lb=320 lb)

Falk's new EQUI-POISED* Motor Mount is a

rigid, all-steel weldment, pre-drilled for bolting standard NEMA foot-mounted motor (1/2 to 30 hp) directly to the steel frame of Falk Shaft Mounted, Flange Mounted and Screw Conveyor Drives. With it, motor can be mounted in almost any position around perimeter of reducer.

(**Balancing of forces.*)

Substantial Savings for You

It saves engineering time required to design special motor bases and foundations...saves cost of labor and materials required to build special motor foundations...and saves on equipment costs by using a quality stock component. Further, its quick installation and easy maintenance mean added cost savings. The Motor Mount is a space saver, too. Where restricted space is a factor, ability to mount motor in any of several positions is an important convenience...For information on range of sizes, dimensions, etc., contact your Falk Representative or Distributor—or write direct for Bulletin 7100.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

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more modest progress does reflect a slowing down in expansion.

This slowing down has even been felt by a number of companies, which have recorded a regression from the previous year, since the production, spread over the year, of nearly 12 new machines is responsible to a large extent for the increase of 2 or 3% recorded by all papers outside of newsprint and magazine papers.

As far as paper grades are concerned, we have noted a tendency toward the finer grades. This trend is particularly pronounced in paperboard which shows a marked trend toward finer qualities and thin types.

In this field, aside from production increase through the modernization of existing machines and the addition of new machines, we have noted a new set-up as a result of the establishment of a company in whose capital six paperboard manufacturers participated, five of these being members of the board of directors of such company. This new set-up, which consists in bringing together medium-size businesses, aims at facilitating specialization efforts and the conclusion of technical, commercial and other agreements.

Finally, the expansion in the field of corrugated cardboard continued during 1959, although at a slower pace than during the previous year.

MR. WALKER, who directs one of Europe's biggest paper manufacturers: ". . . indefinitely increasing demand, subject only to temporary setbacks which are normal . . ."

British Industry Stability Will Overcome Trade Problems; Rising Demand Foreseen

By PHILIP G. WALKER, F.C.A.
Managing Director,
Reed Paper Group

—London

● The year 1959 has been one of growth and additional strength in the British paper industry. No doubt this growth of demand has been stimulated by the general British and European economic expansion, but, at the same time, technique and efficiencies have improved considerably.

1960, for British paper and board makers, is to some extent overshadowed by the question of the effect of the coming into operation as from July 1, of the "Outer Seven" Free Trade Area agreement. At the moment, it seems that raw material prices for British manufacturers are rising and that as from July there will be a reduction in paper selling prices due to the duty withdrawal, but costs have been consistently rising for some time and eventually this must be met by some increases in selling prices as it is impossible for increased efficiency of operation to keep pace with permanently rising costs indefinitely.

No Price "War" Seen

I do not believe that the Scandinavians and Finns will attempt to use the EFTA agreement as a basis from which to commence a price war with British manufacturers. I believe that the people in control of the Scandinavian paper industry are not proud of the terrific fluctuations of prices which have occurred in previous years due in many instances to the uncontrolled exploitation of a supply and demand situation. Most of the people responsible I know in these countries are now more interested in long term stabilization and development.

On the other hand, the British paper and board industry now operates from such a substantial and sound basis that in my view it will be able to meet and overcome problems which EFTA will bring.

Most of us are looking forward to a situation of indefinitely increasing demand, subject only to the temporary setbacks which are normal to any industry, and we shall see expansion of the British paper industry both within the country and externally.

Western World Will Make Strong Progress in Many Lines, Says U.S. Leader

By DAVID L. LUKE
President
West Virginia Pulp & Paper Co.

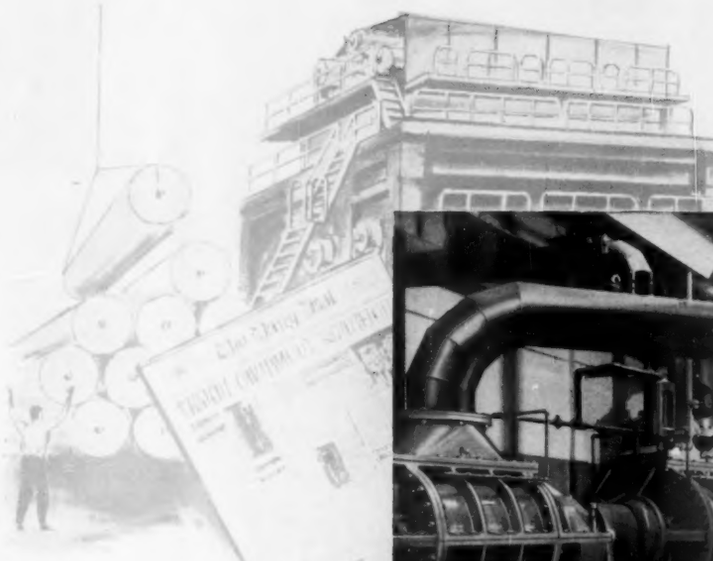
—New York

● I have great faith in the economic prospects and the ideologies of the Western World. I fully expect that we in these United States, along with the other countries, will continue to make strong technological, social, and economic progress.

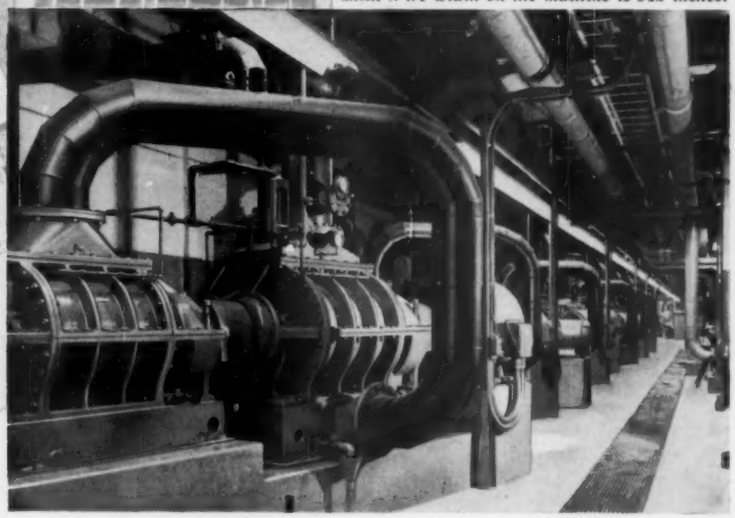
I expect that as we continue to step up our interest in technological research, we will see even more exciting new developments. I also believe firmly that some of the greatest opportunities available to us of the Western World lie in the social sciences. During the period ahead, I expect that research in this field will yield as wonderful, as stimulating, and as exciting results as any of the technological events we have witnessed during the past 25-50 years.

My attitude toward the paper industry closely approximates these viewpoints of the over-all picture—except that, because of the amazing versatility and economy of our products, I expect a better performance from our industry than the average of the economy. Also, since our industry as a whole has in the past been less aggressive in the field of research than some other industries, I expect that as we continue to accelerate our activities in this area, we will find a higher proportion of unexploited fu-

MR. LUKE, president of West Virginia Pulp and Paper Co. and formerly president of the American Paper & Pulp Assn: ". . . competition with other industries will be more intense. . . ."



These Roots RCV2 Vacuum Blowers serve the huge Black-Clawson newsprint machine at Great Lakes Paper Company's Ft. William, Ontario, mill. Wire width on the machine is 342 inches.



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- *Minimum sealing water requirements provides further economy.*
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- *Roots-Connersville provides a wide range of sizes—in both single-stage and two-stage units—to match paper mill requirements.*

Such factors as these—plus a century-old Roots-Connersville tradition for proved design, precise craftsmanship and technical assistance before and *after* purchase—have made Roots equipment a proven choice throughout the paper industry. For example: Roots Vacuum Blowers provide all vacuum requirements for the world's widest Yankee tissue machine in the Crown-Zellerbach Company plant at St. Helen's, Oregon, and for the world's largest and fastest coated paper machine in the St. Francisville Paper Company's Louisiana mill.

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ture opportunities than may be available to competitive industries.

I am inclined to feel that future competition within our industry will minimize, although I fully expect that competition between our industry and other industries will become more and more intense. We have already benefited in important ways from competition with such as steel and glass, wood and textiles. We have faced, stood off and are now beginning to benefit from competition with the miraculous electronics industry, first radio and television, and currently even telephone and such means of communication as are provided by International Business Machines. We are just beginning to face competition from the foils, the films and the plastics. I have a strong feeling that the vitality of our industry, based on what I have already referred to as its great versatility and amazing economy, will enable us to benefit also from the developments that the future may hold in films and foils and plastics.

So, while I expect to see vigorous competition, we in our company at least welcome the challenge. I believe that we will continue to benefit from it just as the western world benefits from all the freedoms that are basically the source of its strength.

French Forests Hold Great Potential for Europe, But Mills Need to be Built

By STANISLAS DARBLAY
Director-General
S.A. des Paperteries Darblay

—Paris

● In 1959 the French government adopted a policy designed to strengthen its economy and improve the monetary and financial situation. As could be expected, this resulted in a slowdown of industrial and commercial expansion. In turn, the consumption and, consequently, the production of various kinds of papers and cardboards have been comparatively stable since last year. The only exception is in the production of newsprint. Two new machines have increased the output by 150,000 metric tons over 1958.

Forests Will Prove Future Asset

To meet the growing needs of its own market and the possibilities opened by the new European Economic Community, the French paper industry will have a very important asset in the coming years: there are, in France, large areas of leafy woods and agriculture can supply large amounts of straw or annuals.

But, even though French forests have a considerable potential value, the problem remains to build the factories which will process these woods and annual fiber plants and make them into pulp. Despite the efforts our industry has made along these lines in the past years (French mills used one million steres of virgin fibrous materials in 1959) this development has only started and new capital will have to be invested to build new mills or additions to the existing mills.

If, as can be expected, the consumption of paper and cardboard in the free countries of Europe and the countries of North America keeps on increasing at the same rate as during the last few years, not only will the present supply of pulp be rapidly exhausted, but new and large amounts of pulp will be needed to meet the needs of the paper industry. It seems certain that the amount of wood now available, particularly from Scandinavia, will not be sufficient to meet the demand. It will then be necessary to use other existing fibrous resources such as the leafy woods and annual plants profusely found in France.

It is of the utmost importance that the French industry be given the opportunity to get ready for this moment, which may come sooner than expected. The obvious possibilities should not be wasted by refusing that industry, during the years when it will have to invest heavily, a protection against unreasonable speculative deals that often take place in the pulp market.

That is why we think the European Economic Community "Inner Six" nations must secure protection for its paper-pulp and cardboard-pulp industries. The setting up of a European market grouping totaling at least 160 million consumers is of great interest to the French paper industry as it is bound to increase consumption and bring about a specialization of factories and machinery.

On the other hand, the French paper industry is definitely opposed to a sudden and total suppression of customs as could be suggested when discussing a zone of free exchange.

The suppression of tariff-walls now in effect among the six countries of the European Economic Community is possible only because it contains clauses to bring to the same level, in these same countries, the essential basic conditions of economy: salaries, taxation, freight rates, energy, etc. It can already be seen that, as a result of the agreement signed in Rome, there is very little difference in salaries in France, Germany and Belgium.

It is only when similar conditions can be created in all other European countries that it will become possible to consider a total repeal of tariffs, as they would then be unnecessary.

Improved Utilization and Processing Must Answer Economic Challenge to Canada

By M. J. FOLEY
President
MacMillan, Bloedel & Powell River Ltd.

—Vancouver

● As the world's largest trading nation, per capita, Canada is currently facing the fiercest economic challenge in its history.

World capacity to produce many of Canada's staple exports has increased to the point of over-supply and competition from the strengthened economies of overseas countries has greatly intensified. Mainly through these developments, the nation's balance of payments last year reached a record high deficit.

MR. FOLEY, president of the combined MacMillan, Bloedel and Powell River companies, says "Canada is currently facing the fiercest economic challenge in its history."

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**Consult factory on availability of 12"

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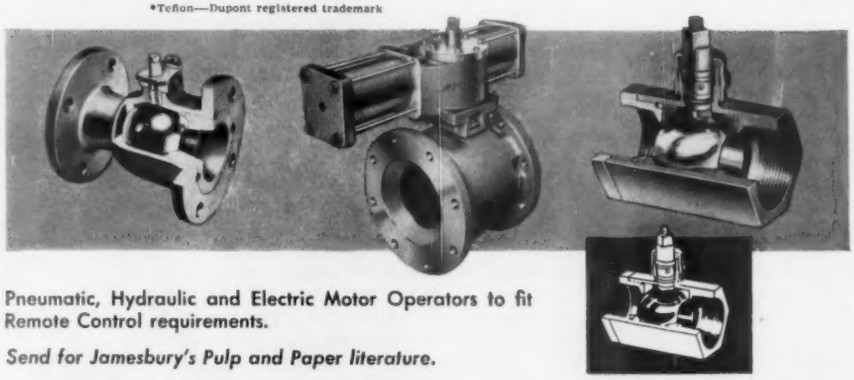

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The national position reflects in many ways that in which the pulp and paper industry now stands, since this is the country's largest manufacturer and its exports contribute one-fifth of the value of the nation's exports.

Current emphasis in the industry is therefore on the discovery and development of improved techniques of utilization and processing, with the aim of strengthening competitive positions through efficiencies in manufacturing and through better product quality and service.

The trend is to larger and more integrated company organizations to support research and reduce duplication of effort; and within those organizations to bring all phases of production into the closest relationship with the market's changing needs. Through these efforts, the industry is confident that it will benefit most fully from the growing demand in prospect for the long-term.

MR. KIHLMAN, general manager of Tampella Industries, says "timber resources are large enough—there is also sufficient labor."

Finnish Expansion Involves Many Problems; Shortage of Paper Industry Engineers

By AKE KIHLMAN
General Manager
Tammerfors Linne-och Jern Manufaktur AB

—Helsinki

● Finland's pulp and paper industry works chiefly for export markets. Of the total fiber production of 3.5 million tons, over 90% is exported either as pulp or converted into paper and board.

Finland's pulp and paper industry is today investing vigorously. It is not only a matter of major expansion of production capacity. The machinery required to keep up with technical advances is also being renewed. Indeed, most of the increase in production capacity will come from modernization and enlargement of existing plants. Capital will be invested in machinery that it has been impossible to renew earlier because of the shortage of funds in the country. New chemical pulp bleaching plants have already been completed and more are under construction.

Our raw timber resources are quite large enough to satisfy the increased demand arising from expansion. There is also sufficient labor available. Industry mostly trains its own skilled labor at the mills.

The situation is not as good with graduate paper engineers. Firstly, the expansion of production and the intensified quality control ties up a greater number of persons with good training. Secondly, engineers are needed for construction work on the machines and equipment required by the domestic pulp and paper industry. These products have in fact become also a notable export article for Finland.

The expansion of the paper and pulp industry also has strong influence on goods traffic. To secure good communications close attention has been paid to development of transport facilities in the country. The industry has actively participated in these plans.

Finland's pulp and paper industry, taking the general view, feels a definite optimism about the situation today. This is due to the stabilization of the market in 1959 and the probable long-term persistence of demand.

Steady and Sound Growth in West Germany Is Noted by German Leader

By DR. HERBERT ROHRER
Chairman of Managing Board
Feldmühle Papier und Zellstoffwerke AG

—Düsseldorf

● In Western Germany a vigorous economic revival began in spring 1959, after business had been more or less stagnant in 1958. Though the West German paper industry did not share in this development until mid-year, results over the year under review were satisfactory.

Order bookings of the West German paper industry in 1959 increased by about 11%, while the total output itself went up about 7% to a new all-time record of 3.11 million metric tons. The situation was also favorable in the pulp industry, where the production of paper pulp increased by 4% to 520,000 metric tons and the production of man-made fiber pulp to 190,000 metric tons. Due to a further decline of sales prices, the turnover of West German paper and pulp producers only moved up 4% to DM 3 39 billion. On the other hand, among the industry's buyers, paper processors achieved a 6% turnover increase, and the printing and duplicating industry even a turnover increase of 8%.

This development must be looked upon not in the least as a result of exceedingly liberal West German tariff

DR. ROHRER, who heads one of Europe's major paper companies says: ". . . duties lowest in Western Europe . . ."

policy as far as the industrial sector is concerned. Thanks to the fact that Western German duties on paper and board are the lowest in Western Europe. Germany, before the war an important paper-exporting country, now counts among the traditional importing countries like the Benelux-states and Great Britain, where the share of imports in the total domestic supply amounts to around 25%.

The market supply of paper and board in Western Germany in 1959, at 3.84 million metric tons, was well over 9% larger than the year before. Almost half the increment was in imported goods, the other half in German-made paper and board. The per

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capita consumption was calculated to be 71 kilograms, as against only 66 kilograms in 1958. Thus, as regards per capita consumption, Western Germany, together with the Netherlands, ranks fourth in Western Europe behind Scandinavia, Great Britain, and Switzerland.

From the point of view of domestic producers the favorable aspect which is revealed by the above mentioned figures is a trifle disturbed by the discrepant development of sales prices on the one hand and costs on the other. The strong pressure of imports, which is owed to competition from more favorably localized production areas, caused the sales prices to decline by further 4% or so, while on the cost side, personnel expenditure, to give one example, rose by 7%.

As to sales prospects, the Common Market is beginning to create conditions for mass production on a broader basis. Western Germany, being the largest producer and consumer of paper within this European Economic Community, occupies a favorable initial position in this respect.

In the near future, however, keen competition on the West German market will continue, particularly coming from the Scandinavian countries. The import pressure will not be relieved until the EEC Common External Tariff is introduced, by which German duties in the paper section will be scaled up, while reductions are to take place in France and Italy. This ought to correct the present unsound concentration of paper exports upon the West German market.

MR. FARROW in his report predicts: ". . . ever increasing number of new uses for paper and board . . ."

Report from Britain Says Paper Industry Is Both Buoyant and Confident

By L. W. FARROW, C.B.E.
Chairman,
Wiggins, Teape & Co. Ltd.

—London

● 1959 saw a very high level of industrial activity in Britain and I am pleased to say that the paper industry received its full share of the boom conditions. The total output of paper and paperboard from British mills was a record 3,657,680 tons, being some 6.5% higher than in 1958; and in addition, imports were 8% higher at 1,413,433 tons. As exports were disappointingly 5% lower, the per capita consumption rose by 7%, to 208 lbs.

With the ever increasing number of new uses for paper and board, this consumption should show a steady increase and the outlook remains very hopeful. However, there are clouds on the horizon—easier importation from the "Outer 7" countries (members of the European Free Trade Assn.) and increasing difficulties in exporting to Common Market countries ("Inner 6")—but the British manufacturers are preparing themselves to meet this challenge and are in no way pessimistic for the future. Already new records have been reached for the first quarter of this year and it would be a fair summary to say that the industry was both buoyant and confident.

Record Production by French Industry, Mostly in Newsprint, Exceeds 3rd Plan

By FERDINAND BÉGHIN
President and General Director
Société F. Béghin

—Paris

● On account of improvement recorded during the last quarter of 1959—when compared with the previous ones—last year's overall output of the French paper industry exceeded that of 1958 by 151,000 metric tons or some 7%.

It must be pointed out however that newsprint's share in this increase was nearly 122,000 metric tons. Had unnecessary imports of this grade not been so very important, production would have been higher, the more so that these 122,000 tons only represent part of the newsprint mill's capacity. Anyhow, as far as newsprint is concerned, 1961 figures, as scheduled in the 3rd Plan, already overshoot the mark.

Printings and writings output, although quite similar to that of the previous year, was some 91,000 tons below the Plan's forecasts.

MR. BÉGHIN, president and general director, Société F. Béghin, one of France's major pulp and paper companies, reports on the important trends affecting this industry in France.

Some slight increases were recorded in kraft and thin papers: kraft production already got beyond what was planned, but thin and specialties papers were some 12,000 tons below, so that prospects for the future are quite bright.

It is quite difficult to give detailed figures concerning other grades but cumulated production of wrappings and boards was some 2% higher than that of 1958.

Although overall paper and board production reached the record figure of 2,336,000 tons, it was some 234,000 tons below the Plan target for 1961. If the resumption recorded for the past months is likely to expand, as some signs already permit us to believe, the mark will be easily reached at maturity. Obviously, such a resumption is dependent on the evolution of consumption, as present capacity of production of the industry (2,800,000 tons at the end of 1959, according to a recent survey by the French Pulp & Paper Association) should already permit the industry to face a much greater demand.

Further Increase Expected

The main characteristic of the three last quarters of 1959—similar to that of the first three quarters of 1958—

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Left to right—Bob Howard, sales representative; Paul Johnson, Technical Services staff; Charlie Penning, sales representative; Al Hose, Technical Services staff.

Lindsay sales representatives have frequent occasion to meet with members of the Lindsay Technical Services Division in Cleveland. *Purpose:* to discuss real conditions and find practical answers to problems which arise in the plants of paper manufacturers.

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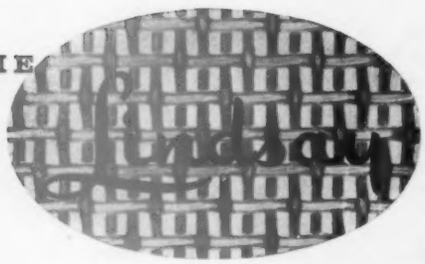

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was a relative stability in prices. As a matter of fact the paper and board index for December 1959 was 193. It is likely however that an increase will be recorded during the coming months, mainly on account of higher quotations for imported pulp.

During 1959, a considerable improvement was also recorded in the foreign trade balance of our industry. When by the end of 1958 imports of pulp, paper and wood exceeded exports by 41 billion francs, the deficit only reached 29 billion francs on December 31 1959. And, to get a clearer picture of the situation, it must be kept in mind that the franc has been devaluated in December 1958.

Resumption of paper and board exports, the first signs of which had been noticed during the last quarter of 1958, gradually proceeded since then. Average monthly sales in foreign markets were 10,000 tons during 1959. On the opposite side, mainly on account of the increased production capacity due to the two high speed newsprint machines put into operation, paper imports were considerably reduced. Finally, and this fact deserves special attention, pulp imports were 30,000 tons lower than the previous year, which means that French paper and board mills are gradually using less and less foreign pulp.

If, in France, the crisis has been sensibly less acute than in the United States, resumption was slower. Not taking the two new newsprint machines into account, the increase in paper and board production was very slight. But the evolution is quite similar: if American paper makers are of the opinion that new outlets are to be found in a growing number of customers and in a greater per capita consumption, their French colleagues have at least two reasons for being optimistic; a) the demographic expansion, b) the present rather low consumption just over 50 kgs per inhabitant.

Canada's Position Is Healthy; Efforts Must Be Made to Maintain Leadership

By D. W. AMBRIDGE
President
Abitibi Power & Paper Co., Ltd.

—Toronto

● There can be no doubt that the world's consumption of paper will increase almost explosively in the next few decades.

Education and rising standards of living all over the world will provide a demand for newspapers, school books and miscellaneous reading matter which will tax the capacity of the industry to its utmost.

We in Canada, however, should not assume that the world will inevitably or permanently turn to us to supply these needs. All over the world paper machines are being installed and each year new raw materials make their appearance as a result of the greatly increased research efforts which are being devoted to the development of the industry.

Certainly we in Canada have a leading position as a supplier of the world's needs for paper, paperboard and pulp and we must do everything we can to maintain our leadership. This means not only building facilities of all kinds in Canada but building them in the far corners of the world.

Canadian papermakers and Canadian papermaking engineers and technologists are among the best in the world and we must arrange to use them anywhere an opportunity presents itself.

The Canadian industry's research facility, the Pulp and Paper Research Institute of Canada, is the leading center for pulp and paper research in the world and, properly used, should contribute substantially to the maintenance of Canadian leadership in many aspects of pulp and paper.

MR. AMBRIDGE president of Abitibi Power & Paper Co., predicts explosive increase in paper consumption in the next few decades ". . . but we in Canada should not assume the world will inevitably or permanently turn to us to supply these needs . . ."

Expect New Records in U.S. Industry; Broad Opportunities in New Markets

By W. R. ADAMS
President
St. Regis Paper Co.

—New York

● Continued growth in demand for paper and paperboard is predicted and it is significant that demand actually exceeded the prediction for 1959 made in the 1954 Stanford Institute report.

We expect new record levels to be established in the U.S. paper industry this year despite the recent decline in the general economy. In the first quarter of 1960 industry production was 8% above the first quarter of 1959 and a new all time high quarterly record. However, gains for the full year are likely to be at a more moderate rate than in 1959. It is possible that such a stabilized business climate may have a beneficial effect in prolonging the upward business cycle.

We feel that the broad opportunity for the paper industry, however, is in the many fields uncovered by the industry's research staffs for extension of the use of paper into new areas including many where combinations of paper and plastics have enlarged the possibilities for paper and paperboard.

With the demand for paper products increasing as the population expands and with industry continually developing new uses for its products, we feel that the outlook is one of continued growth and prosperity.

MR. ADAMS, president of St. Regis Paper Co., urges extension of the use of paper into fields where combinations of paper and plastics have enlarged possibilities.

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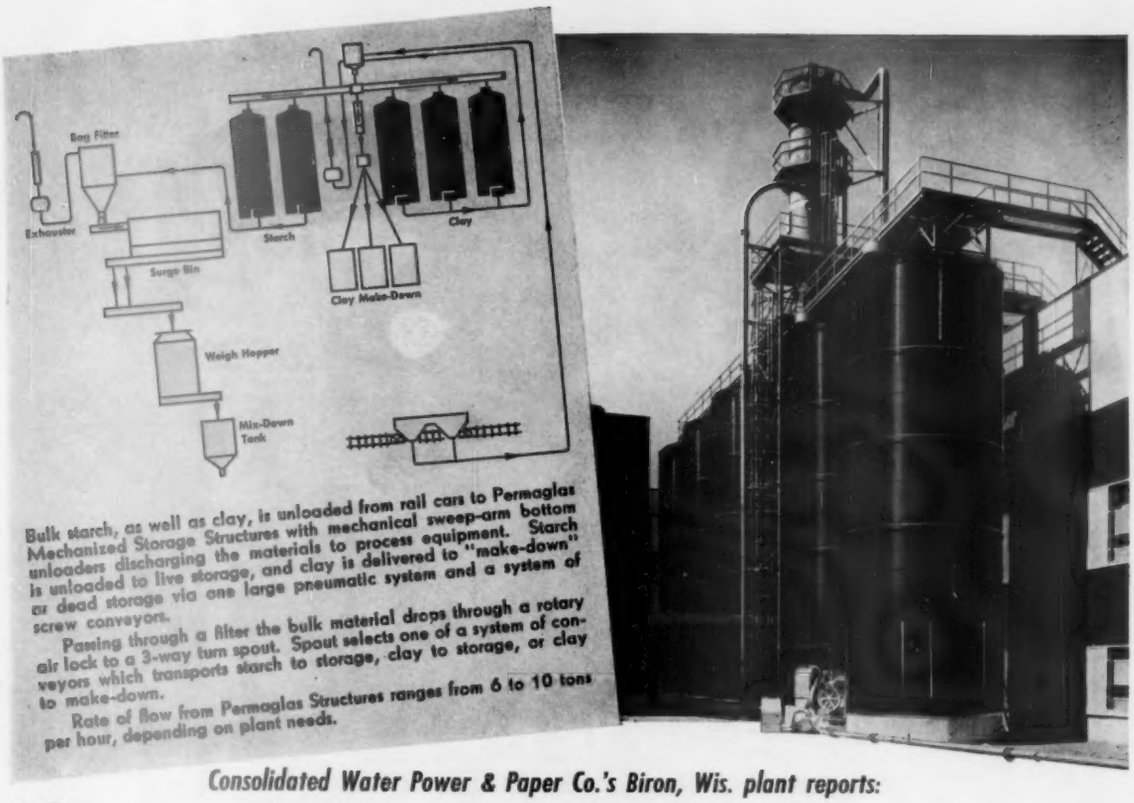

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divisions: PANDIA DIVISION, PULP MILL EQUIPMENT • SHARTLE DIVISION, STOCK PREPARATION EQUIPMENT • PAPER MACHINE DIVISION, PAPER & BOARD MACHINES • DILTS DIVISION, CONVERTING EQUIPMENT • AIR SYSTEMS DIVISION, AIR DRYING EQUIPMENT • BLACK-CLAWSON (CANADA) LIMITED, CANADIAN SALES AND SERVICE • BLACK-CLAWSON INTERNATIONAL, LTD., 18/19 SAVILLE ROW, LONDON, ENGLAND

plants: HAMILTON, OHIO • MIDDLETOWN, OHIO • WATERTOWN, N.Y. • FULTON, N.Y. • NEWPORT, ENGLAND

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The Arithmetic of Materials Handling

Fuller Airveyor, powered by diesel-driven blower, conveys wood chips from chip hopper at unloading dock to chip loft over digesters, at the Ocean Falls, British Columbia, paper mill of Crown Zellerbach Canada, Ltd.

FULLER PNEUMATIC CONVEYING SYSTEM SPEEDS WOOD CHIP HANDLING FOR CROWN ZELLERBACH

Chips are conveyed at 67 tons an hour through 1760 ft. Fuller Airveyor® system at Crown Zellerbach Canada, Ltd. Wood chips for kraft paper production are picked up at dock-side and are sped one-third of a mile through a 16-inch pneumatic pipe line. With few moving parts, the Airveyor requires practically no maintenance. Operation of this air and moisture-tight system is unaffected by exposure to the elements.

Here is a good example of the ease with which a Fuller Airveyor conveys over long distances. The Airveyor is also a highly compact and flexible system for moving almost any dry, finely-divided bulk material. The pneumatic lines turn sharp corners, run between plant floors, fit snugly into unused, overhead spaces — without disrupting existing facilities.

Fuller has specialized in pneumatic materials handling systems for more than 30 years. One or a combination of Fuller systems can be the solution to your materials handling problem. Write or call Fuller today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendations.

1176
A 271

FULLER COMPANY GENERAL AMERICAN TRANSPORTATION

Fuller
pioneers in harnessing AIR

FULLER COMPANY
128 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Offices in principal cities throughout the world

THE NET OF IT—Alpha® Protein helps merchandise move

In today's sweeping trend toward self-service, products sell best when customers "get the message". This means strong visual appeal of the package itself . . . sparkling presentation to promote the product and the brand name.

Alpha Protein has come into wide application as the adhesive for coated paperboard used for fine folding cartons. It makes possible the level, more uniform surface needed for the detailed reproduction of fine-screen halftones with maximum depth and clarity. It offers extra brilliance for instant vivid display of the all-important brand name.

Alpha Protein works economic and production miracles on any coating equipment: brush coaters, reverse roll coaters, air-knife, trailing blade, or high-solids roll coaters. Principal benefits are faster machine speeds . . . less drying time . . . higher coat weights.

This is the net of it . . . but may we tell you the complete story? Your inquiry will receive prompt attention.

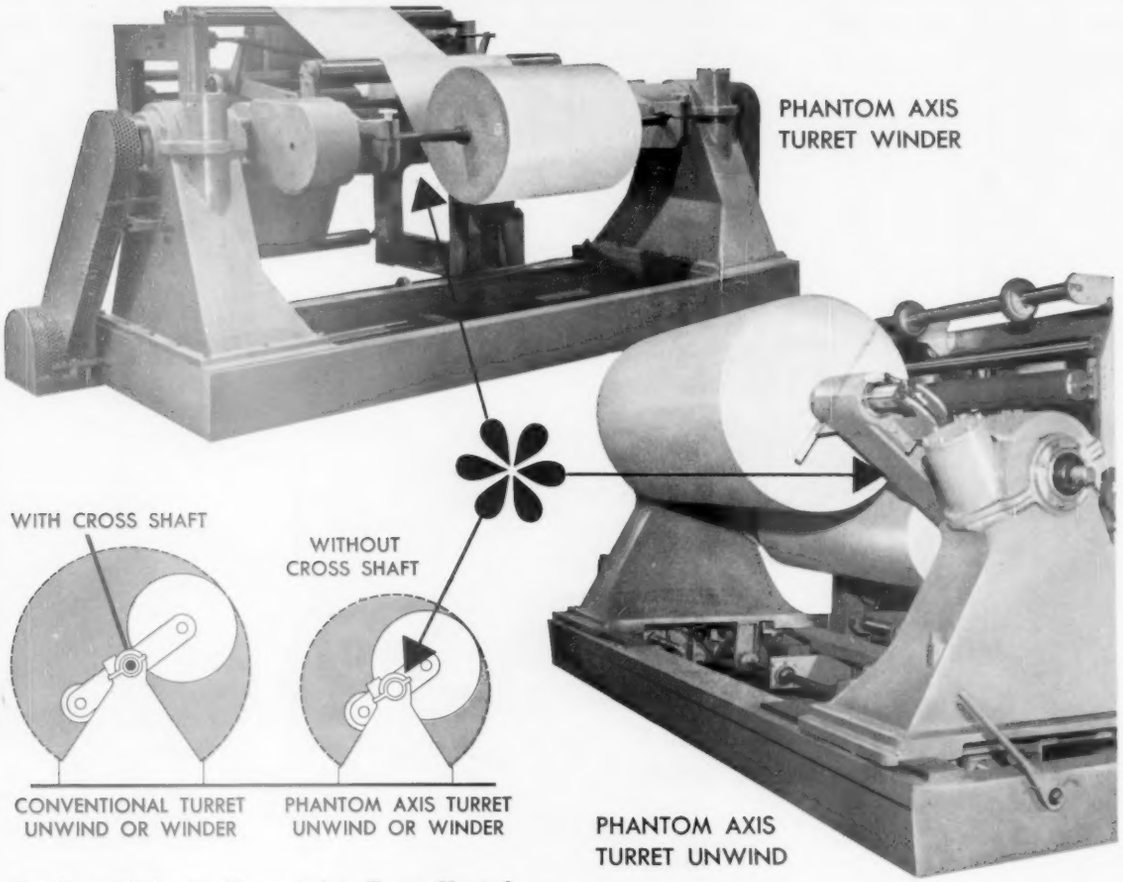
25

CENTRAL SOYA COMPANY, INC.
CHEMURGY DIVISION

1825 N. Laramie Avenue · Chicago 39, Illinois

This is a sample of 4-color process lithography on Alpha Protein-processed paper

IT'S WHAT'S NOT THERE THAT COUNTS*



Egan's revolutionary Phantom Axis Turret Unwinds and Winders *eliminate* the center cross shaft for greater roll diameters and more compact overall design. In addition, these units require less overhead and floor space for installation (see drawing).

The more compact design also assures greater rigidity and better operation at high speeds. Phantom Axis Unwinds and Winders are engineered to permit speeds in excess of 1000 fpm; are available in web widths through 120", and include power rotation of the turret and knife cut-off as standard features. Air chucking of cores or shafts is available at the customer's option.

ADDITIONAL FEATURES

PHANTOM AXIS UNWIND: Automatic or manual side shifting; provision for splicing with either inside or outside of web up (optional); flying splices at full machine speed; pneumatic constant tension system (optional).

PHANTOM AXIS WINDER: Side shifting available (automatic or manual); constant or tapered tension; smooth transfers at full machine speed with unique single motor design.

Egan

CABLE ADDRESS: EGANCO—SOMERVILLE (NJER)

FRANK W. EGAN & COMPANY
SOMERVILLE, NEW JERSEY

MANUFACTURERS OF PROCESSING MACHINERY FOR PAPER, FILM & FOIL, AIR DRYING SYSTEMS; ROTOGRAVURE PRINTING PRESSES; PLASTICS EXTRUDERS & ACCESSORIES; TEXTILE FINISHING MACHINERY.

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340 TONS PER DAY

...MgO Plant On Line At Alaska Lumber & Pulp, Sitka

With the start of the 340 ton per day Alaska Lumber & Pulp Company plant, over 650,000 tons of pulp per year are being produced by the MgO Process.

This is the second* magnesia bi-sulfite dissolving pulp mill in Alaska, and the largest industrial improvement since statehood. Utilizing the commercially-proved, closed cycle MgO Recovery Process, Sitka's predicted chemical usage is 20 lb of MgO and 50 lb of sulfur per ton of unbleached pulp.

Two B&W recovery boilers, each designed to process 550,000 lb of waste sulfite liquor solids per day, generate a combined total of 228,000 lb of steam per hour. Two B&W power boilers provide supplemental steam for power and process to 320,000 lb per hour burning bark or oil singly or in combination.

The MgO Process provides economical recovery of chemicals and heat from the waste sulfite liquors. In addition, air pollution and process odors are reduced to an absolute minimum. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

***Sitka** *is the fifth MgO plant built in recent years in the continental U. S. Others are Weyerhaeuser Timber Company, Longview, Washington; Ketchikan Pulp Company, Ketchikan, Alaska; Weyerhaeuser Timber Company, Cosmopolis, Washington; Brown Company, Berlin, New Hampshire. A sixth plant is on order for Hylte Bruks in Sweden.*

P-826

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

S. R. CHRISTENSEN

Beloit Eastern's "Pat" Patterson

Here is where design for outstanding finished product processing equipment begins—under the capable direction of H. R. ("Pat") Patterson, Beloit Eastern Corporation's Chief Engineer. For ten years he has been closely associated with the design and development of Beloit equipment. Modern, functional, dependable designs are the prime concern of "Pat" and his staff of experts—drawings for translation into fine equipment by Beloit Eastern Corporation's skilled craftsmen. These men make sure that your designs are developed with close attention to detail.

FINISHED PRODUCT PROCESSING EQUIPMENT

Winders • Petite Winders • Slitters
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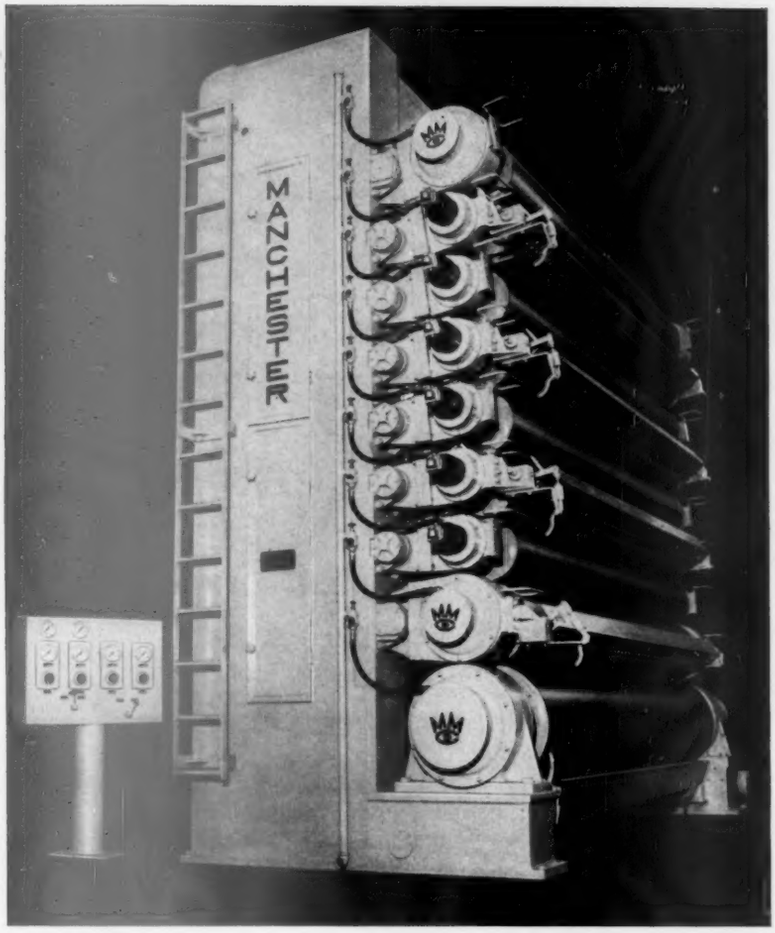


Manchester gives you everything you want in a calender

New Manchester nine-roll, 147 inch face open side calender built for Champion Paper & Fibre Company, Hamilton, Ohio

Here is a truly *new* open side calender *with independent load control of any roll in the stack.* Now you can produce a smoother, more uniform finish on a wider range of fine papers. Another outstanding feature is Manchester's air-over-hydraulic loading system. It permits precise pressure adjustments for all rolls . . . gives you all the advantages of sturdy hydraulic loading . . . *yet uses only ordinary mill air pressure as a power source.* No hydraulic pumps, tanks or motor drives needed!

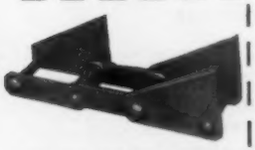
All loading, unloading and *nip relieving* is accomplished through levers within the rugged, all-steel calender frames. Every adjustment is under finger-tip control from a master console.

This new calender is another example of how Manchester builds profits for paper makers through *modern,* efficient design concepts. For the new equipment you're planning now, why don't you call in the Man from Manchester? **The Manchester Machine Company, Middletown, Ohio**

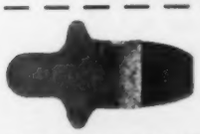
Manchester . . . profit builders for paper makers

THE MANCHESTER MACHINE COMPANY

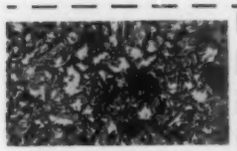
POWERFUL CHAIN FOR PULPWOOD HANDLING

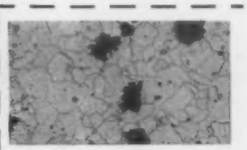


Attachments are available to suit a variety of conveyor applications.



File-hard surfaces of Flint-Rim sprockets help maintain efficient, dependable performance of chain and sprockets . . . prolong chain life.





Promal or file-hard Promal chain can be furnished for unusually abrasive conditions. Dark areas in Promal structures (left) show stronger, stiffer reinforcing material. Malleable (right) shows white "free-iron," black is soft carbon nodules.

Broad sliding surfaces of Link-Belt C-132W chain hold up longer on drag conveyors

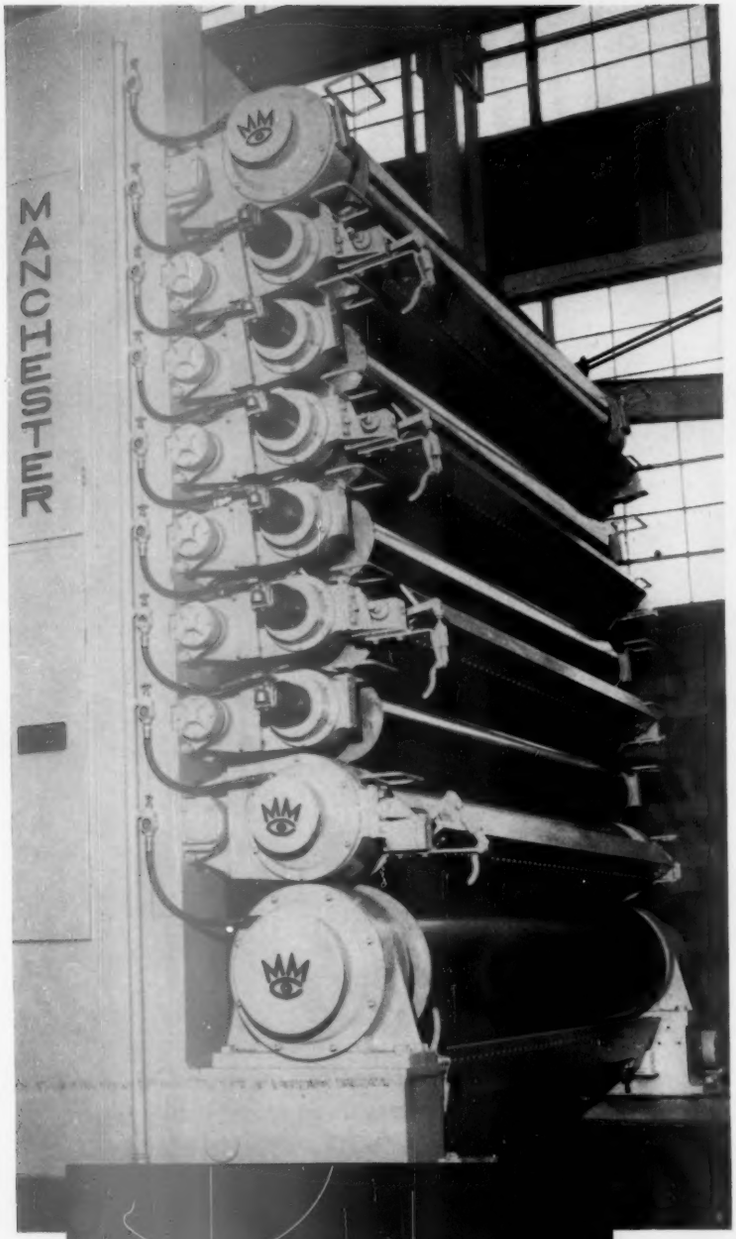
Yes, with its broad top and bottom surfaces, Link-Belt C-132W chain is particularly resistant to the sliding wear encountered on carrying and return runs of drag conveyors. This high durability pays off in low maintenance, minimum shutdowns.

C-132W chain combines cast center links with steel sidebars connected by steel pins — offers ample, live joint bearing area to withstand pulpwood punishment. For further facts, contact your nearest Link-Belt office or authorized stock-carrying distributor, listed under CHAINS in the yellow pages of your phone directory. Or write for new Catalog 1050.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.



You can Rely on Lodding Doctors

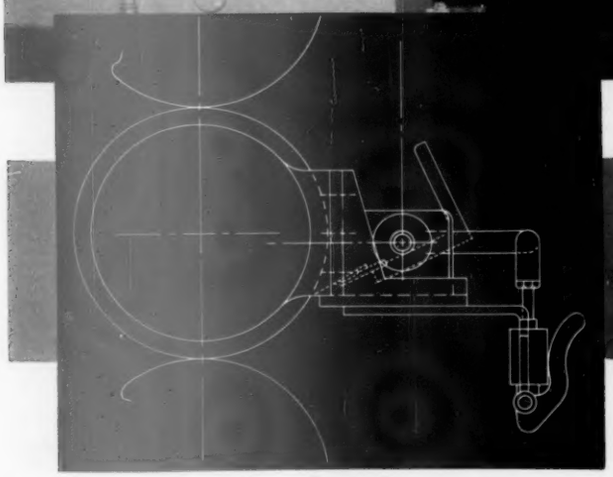
Many progressive manufacturers of paper mill machinery, like The Manchester Machine Company, rely on Lodding's specialization in doctoring to complement their own manufacturing skills. So, besides serving the mills direct, Lodding acts as sub-contractor to the machine builders.

When this happens the engineering staffs of both companies work together for your ultimate benefit.

In sub-contracting, as always, Lodding stands squarely behind every doctor, assuming full responsibility for its workmanship and performance. Each is expressly designed for the exact roll on which it is to be mounted.

On calender stacks, for example, every doctor is built to fit exactly in position. Allowance is made to compensate for the crown in the roll. Doctors are mounted on the roll bearings. In this way each one always rides with the roll, perfectly aligned, exerting uniform pressure throughout. Doctor backs are provided with the necessary rigidity to prevent sag and vibration.

Whether your Lodding Doctors come through a machine builder or direct, you can rely on the kind of performance available only from the world leader in precision doctoring.



Get in touch with your nearest Lodding sales representative for full information.

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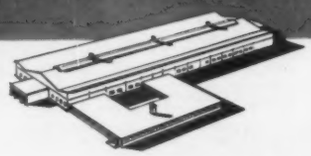

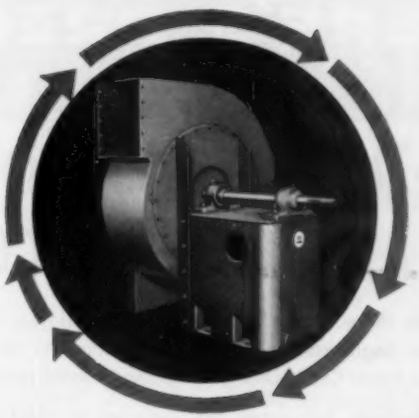

Moving air, gases, materials . . . a job for American-Standard industrial fans

versatility is the word for American-Standard industrial fans. You can get wheels specifically designed for moving air, gases, or materials; pressures up to 18" wg; volumes to 125,000 cfm. Plus a wide choice of housings, arrangements, construction features, and optional accessories to fit individual needs. Which combination for you? Call our nearest office. American-Standard Industrial Division, Detroit 32, Michigan. In Canada: American-Standard Products (Canada) Limited, Toronto. Ontario.*

*American-Standard and Standard® are trademarks of American Radiator & Standard Sanitary Corporation

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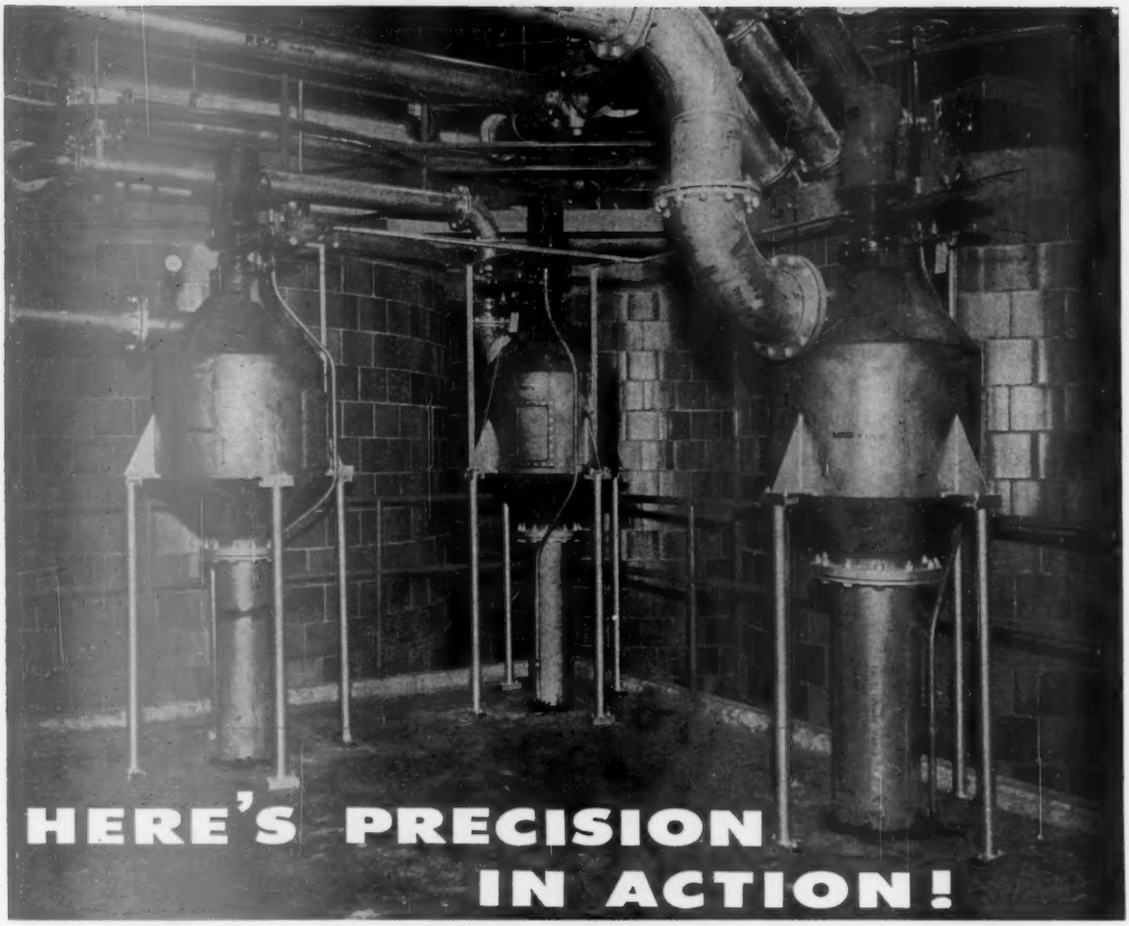

DeZURIK STOCK CONSISTENCY REGULATORS AT CHILLICOTHE PAPER CO.

Here are three of the eight DeZurik Regulators in an installation engineered by Charles T. Main, Inc., for the Chillicothe Paper Co. in Ohio on their No. 4 paper machine.

These DeZurik Regulators are designed to handle the full volume of stock—not just a sample.

DeZurik Consistency Regulators have a long record of accuracy, proved in performance. They're guaranteed to hold consistencies within limits of plus or minus .1% and many of them installed directly ahead of paper machines are holding consistencies to plus or minus .02%!

They're versatile, too! Three basic types of DeZurik Regulators adapt to a wide variety of installations, such as regulating stock after high density storage chests, after broke pulpers, couch pit wet broke control, brown stock washing systems, basis weight, stock metering systems and refining systems. There's a DeZurik Regulator to fit almost every installation and to handle a wide range of tonnages.

With quality control becoming increasingly important in paper mills, the accuracy of a DeZurik Stock Consistency Regulator is your guarantee that—without constant attention—without costly maintenance—you can achieve precise consistency control.

For more information on DeZurik Automatic Recording Stock Consistency Regulators, please write

DeZURIK CORPORATION
SARTELL, MINNESOTA

SCAPA

GROUP "C"

SYNTHO-ASBESTOS Dryer Felts

incorporate our exclusive

* "3-DECKER" STRUCTURE

- Dacron-Nylon Working Face
- Syn-Reinforced Asbestos Center
- Syn-Reinforced Cotton Back

(Approx. 25% Synthetic Content)

They insure excellent drying, combined with unusually high resistance to thermal, chemical and mechanical degradation.

Types 3175-C (SRA) and 3480-C (SRA) supplied in all widths either open-ended or with Clipper Seam.

Type 3980-C (SRA) supplied endless with hand-spliced seam.

*World Patents Granted and Pending

9

SCAPA DRYERS, INC. WAYCROSS GEORGIA •

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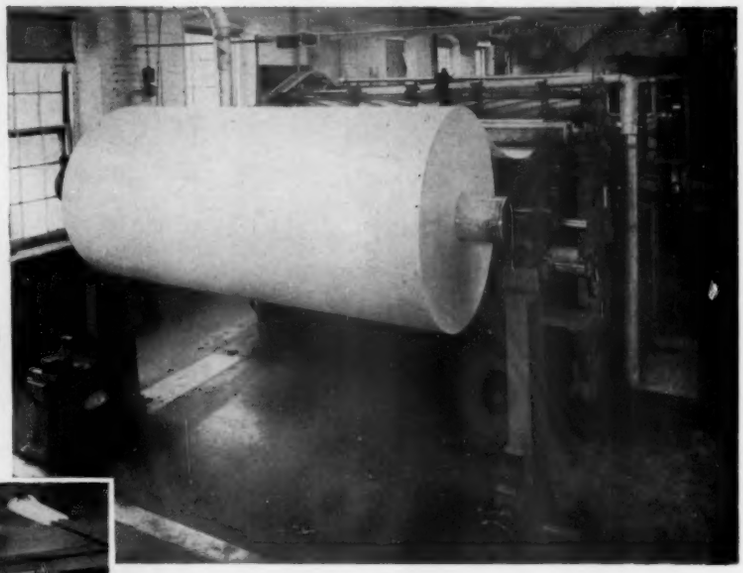
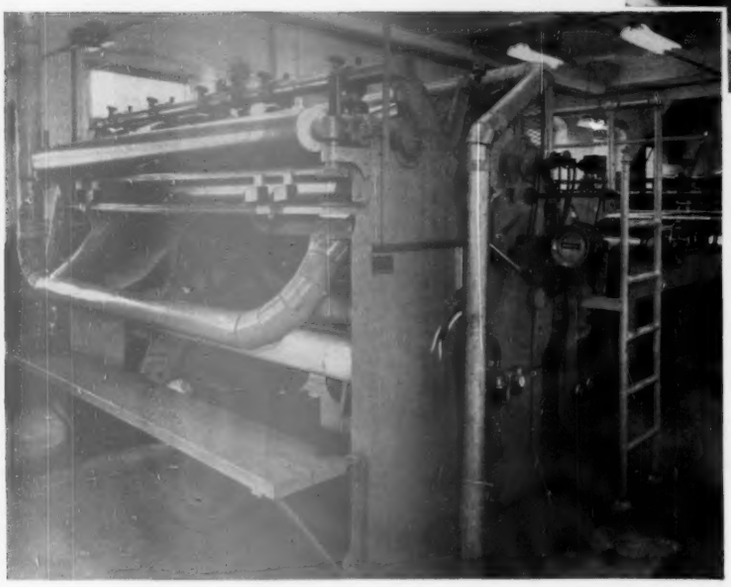
415 JACKSON ST., OREGON CITY, ORE.

Clark-Aiken MACHINERY

tops the HIGH STANDARDS set at

CRANE & CO.
INCORPORATED





Mr. Gilbert D. Kittredge, general superintendent, Crane and Company, Dalton, Massachusetts, writes:

"We have been using Clark-Aiken equipment for over twenty years with excellent results. Our new cutter was installed with a 100" trim paper machine and replaced another type C cutter which was not wide enough for our new installation. The new C cutter represents considerable improvement over the older type which we have had in service for a good many years. Considerably higher cutter speeds are possible and with the many adjustments on the machine extremely accurate sheeting may be achieved. We do not operate this particular cutter at high speeds, however, as it follows the paper machine on a three shift basis and the sheeting is watched very carefully for removal of any imperfect paper at this point.

"In the manufacture of our quality papers it is important that a good sheeting job is done and the Clark-Aiken cutter fits this bill extremely well.

"We have always received excellent service and co-operation from the Clark-Aiken organization and can highly recommend their sheeting equipment."

Clark-Aiken machinery—custom tailored to individual requirements—makes fast, efficient and practical automation a reality in your finishing room!

If, like Crane and Company, your primary concern is for quality but you still want to boost production and lower finishing room costs then investigate the advantages of completely integrated equipment designed by Clark-Aiken to fit your needs.

Forward-looking management has been quick to recognize the benefits of practical finishing room automation. And they turn to Clark-Aiken, an acknowledged leader in the manufacture of paper mill machinery, to supply the solution to their specific production problem. Consult Clark-Aiken for immediate and considered attention to your finishing room equipment needs.

THE *Clark-Aiken* COMPANY

957 SPRINGFIELD ROAD

LEE, MASSACHUSETTS

CANADIAN REPRESENTATIVE: GORDON W. KEATES, 133 FLORA DRIVE, SCARBOROUGH, ONTARIO

Bauerite PAYS OFF

Four mills* of the many using the Bauerite® process to make groundwood type pulp from chips are **doubling** their production. Wood economics often force mill owners to look for a substitute for their dwindling supply of softwoods.

Production advantages, new economies and greater profits are available with the Bauerite process. For instance, many have gained a constancy of quality superior to that possible with conventional groundwood. Slabs, edgings, certain sawdusts and chips of irregular size—in various blends and often from species of wood previously not suitable—are being used from local sources. These are some of the reasons why mills find this process profitable. Write, or ask your Bauer representative for complete information.

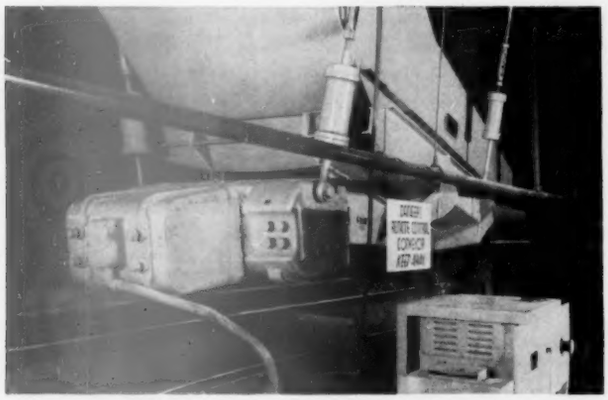
**Gould Paper Co., Lyons Falls, N. Y.; Daishowa Paper Manufacturing Co.; Jujo Paper Manufacturing Co. Ltd.; Tokohu Pulp Co. Ltd., Japan.*

The Bauer Bros. Co.

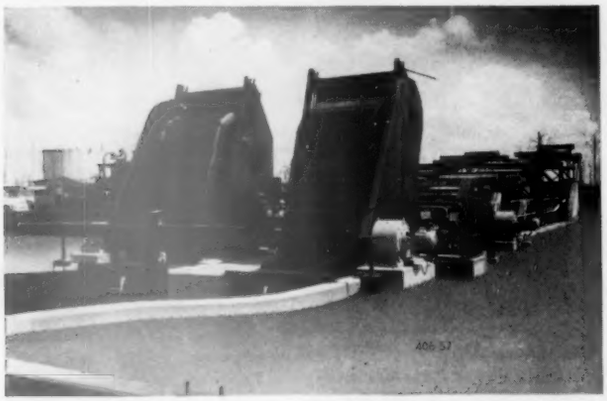
1706 Sheridan Ave., Springfield, Ohio

This Bauer double revolving disc refiner is bound for Gould Paper Co., Lyons Falls, N. Y., where production of Bauerite groundwood pulp from chips will soon be doubled.

Jeffrey belt conveyors transport wood chips to storage towers . . . move material to giant digesters as needed for production of chemical cellulose at Rayonier's Jesup plant.



Jeffrey vibrating feeders automatically control flow of materials in a wide range of processing operations. Here, wood chips are metered from a remote-control location.



Jeffrey bark and grit removal equipment for clarification of processed water.

when they expanded this chemical cellulose plant, they ***re-ordered*** ***JEFFREY*** *equipment*

RAYONIER's new plant at Jesup, Georgia, is a twin to the plant built there in 1954. Each has the capacity to produce over 300 tons of chemical cellulose per day. The remarkably low-cost production facilities were designed and constructed by Ebasco Services Incorporated.

Duplication of the original mill indicates the satisfactory performance realized with the original equipment . . . including Jeffrey vibrating feeders, belt conveyors, bark and grit removal equipment.

Planning to expand your production? It will pay you to call in Jeffrey. For information on Jeffrey equipment for your requirements write The Jeffrey Manufacturing Co., 809 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

Huber Lab Report:

THESE TWO HUBER TESTS ARE HIGHLY IMPORTANT TO YOUR PAPERS

COMPREHENSIVE STUDY of oversized particles *(left)* using a nest of several screens: namely, 80, 170 and 325 mesh. (TAPPI Standard Procedure T645m)

PARTICLE SIZE TESTS, using a hydrometer method *(right)*, determine particle distribution to about one micron. Analysis of finer particles is made with special centrifuges.

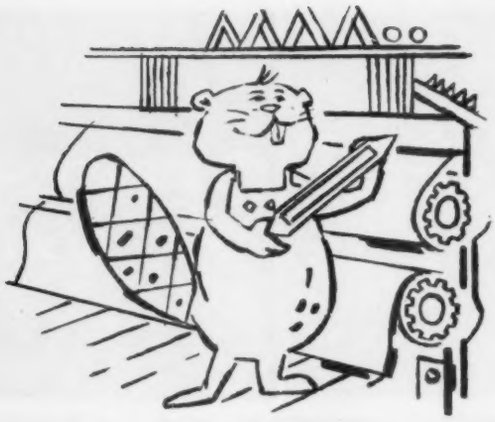
Many important innovations for the paper industry have come from the Huber Clay Laboratories. Among these are the VISCONTROL process for assuring uniform viscosity in clay and the new line of Hydrafine Clays.

The comprehensive quality control tests of our Huber, Ga., laboratory are well-known throughout the paper industry...and our labs maintain a close relationship with customers by rendering technical service. We can duplicate all of the essential stages of paper making from sheet making to finished filled or coated paper. We will be glad to discuss with you how *our* lab services can improve *your* product.

J.M.HUBER CORPORATION 630 THIRD AVENUE, NEW YORK 17

Mines & Plants: Huber, Ga.; Graniteville & Langley, S.C.

HUBER



At ORISKANY...we pamper your felts

From raw wool processing to final inspection, the skilled craftsmen at Oriskany combine their talents and experience to produce your felts to your exact specifications. Carefully-selected wools are sorted, scoured, blended and spun into the finest yarns. Synthetic fibers are often added to meet particular requirements. Modern looms weave flawless machine clothing with magnetically-controlled precision. In our laboratory, constant research has developed special chemical treatments to increase fiber strength and resistance to wear and bacterial damage. Every step of production gets careful examination . . . must meet rigid standards. This devotion to quality control has been an important part of our product since 1869. It is your assurance of dependability when you select Oriskany Felts.

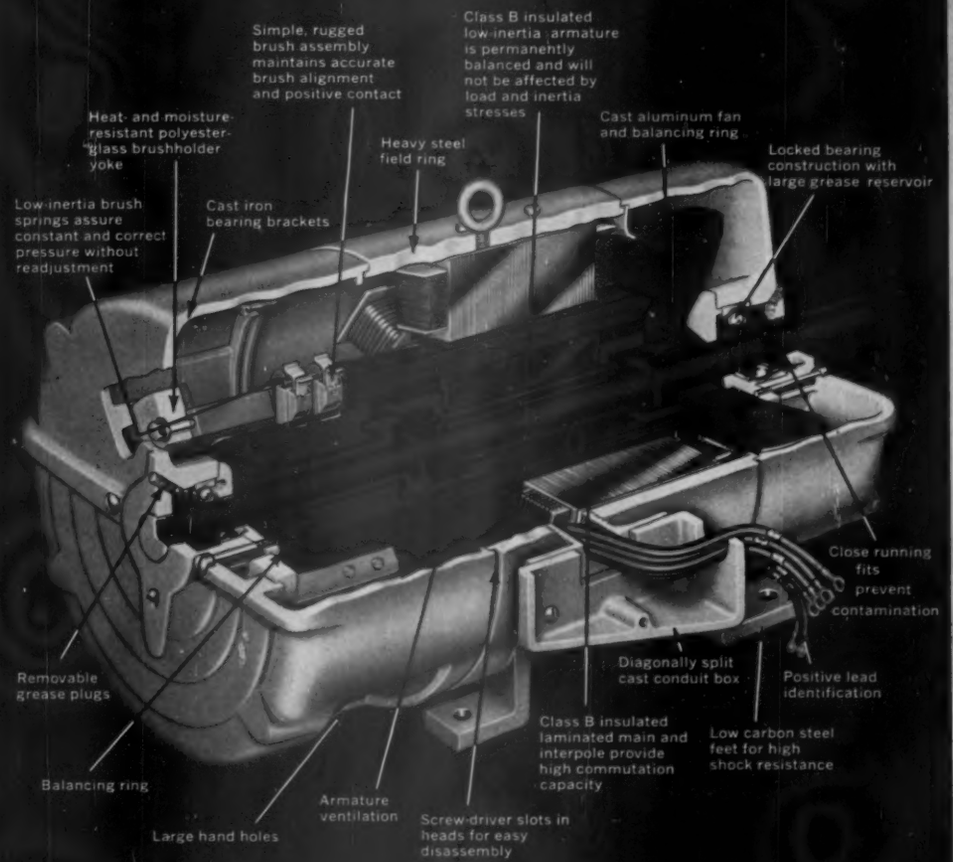
First choice—because They last

Oriskany

WATERBURY FELTS

H. WATERBURY and SONS COMPANY • ORISKANY, NEW YORK

Here's the latest in D-C motor design:


Simple, rugged brush assembly maintains accurate brush alignment and positive contact
Class B insulated low-inertia armature is permanently balanced and will not be affected by load and inertia stresses
Heat- and moisture-resistant polyester-glass brushholder yoke
Heavy steel field ring
Cast aluminum fan and balancing ring
Locked bearing construction with large grease reservoir
Low-inertia brush springs assure constant and correct pressure without readjustment
Cast iron bearing brackets
Close running fits prevent contamination
Diagonally split cast conduit box
Positive lead identification
Removable grease plugs
Class B insulated laminated main and interpole provide high commutation capacity
Low carbon steel feet for high shock resistance
Balancing ring
Armature ventilation
Large hand holes
Screw-driver slots in heads for easy disassembly

...and some easy-to-add field modifications

A-c tachometer for speed indication

A-c motor-driven blower with permanent dry-type filter for easy mounting on bearing bracket

Magnetic disc-type brake with d-c series or shunt, or a-c coils

Helical single, double, and triple reduction gear units for all ratios

New Louis Allis FLEXITORQ® D-C MOTORS

...offer you vastly improved commutation–low brush wear–400% short-time overload capacity–and unmatched flexibility!

Bear this in mind: The Flexitorq is *not* just another *rerated* d-c motor. It's *all new*—and it's been designed to give you more for your power dollar — in superior performance, matchless field flexibility, and unrivalled economy of operation and upkeep.

Advanced armature design and brush construction offers improved commutation, faster response, and lower brush wear. Class B insulation system provides exceptional thermal endurance... is rated for 60°C rise for continuous duty... and creates a barrier to moisture, acids, alkalis, and other contamination.

The net result to you is reliable, trouble-free power for constant and adjustable speed drives. For example, Flexitorq gives you 400% faster acceleration, plus much better deceleration, reversing, and speed changing. You can safely impose 400% intermittent and 15% continuous overloads — and the high-torque design is a welcome plus when you need extra power for hard-to-start machines.

The new Louis Allis Flexitorq is lighter and more compact than previous d-c motors... lets you squeeze more power into less space... yet is actually *easier* to service! Brushes and entire brush-holder assemblies can be quickly inspected and removed without major disassembly. And since brush springs remain conveniently attached to the brush holders, brush changing is a simple affair.

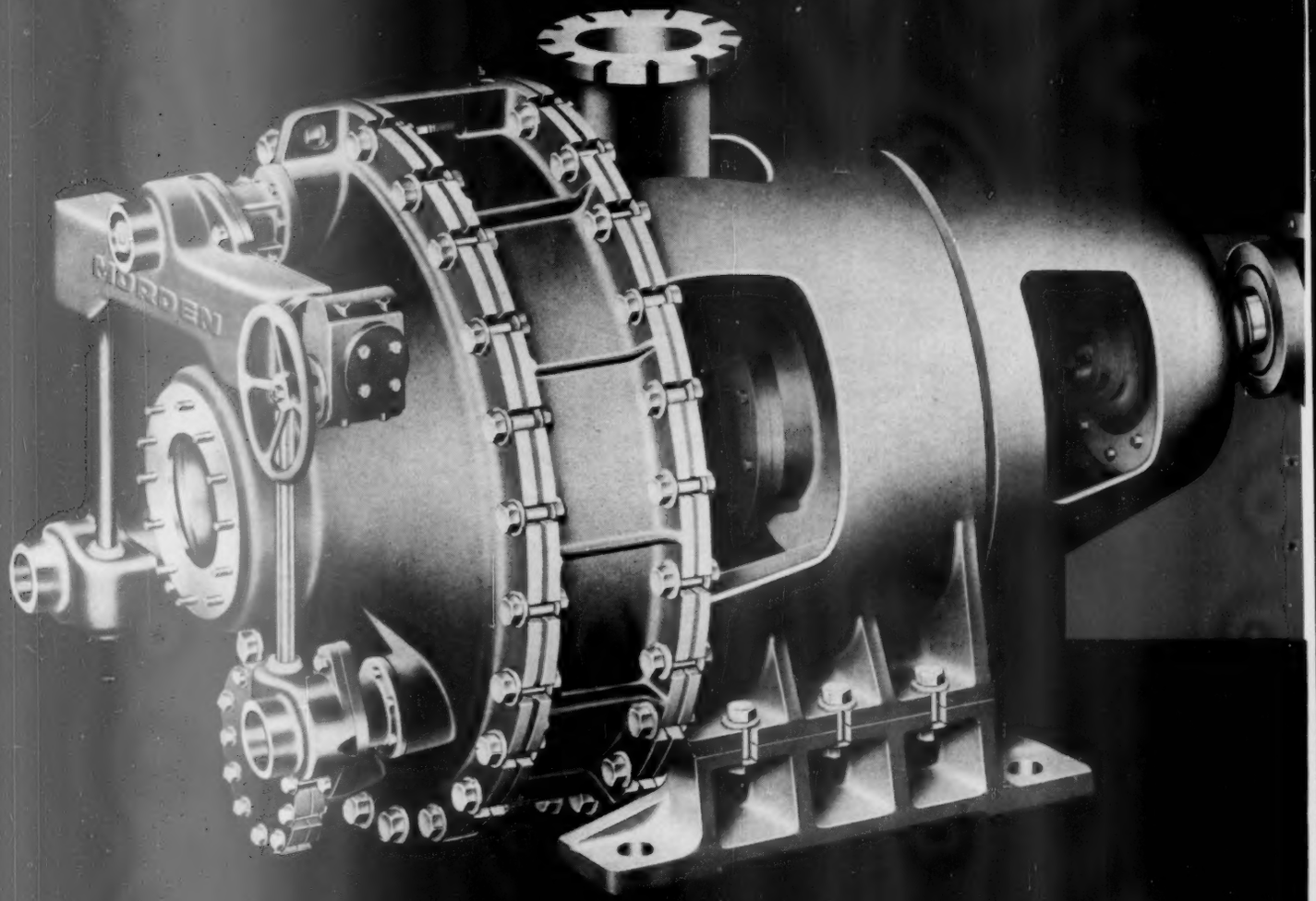
Flexitorq d-c motors are available in sizes from 1 to 400 hp — in various enclosures. See your nearby Louis Allis District Office for information and application help. Or write for Bulletins 3150 and 3200 to The Louis Allis Co., 444 E. Stewart St., Milwaukee 1, Wis.

LOUIS ALLIS

D6-317

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

A BRILLIANT TRIUMPH IN STOCK PREPARATION EQUIPMENT

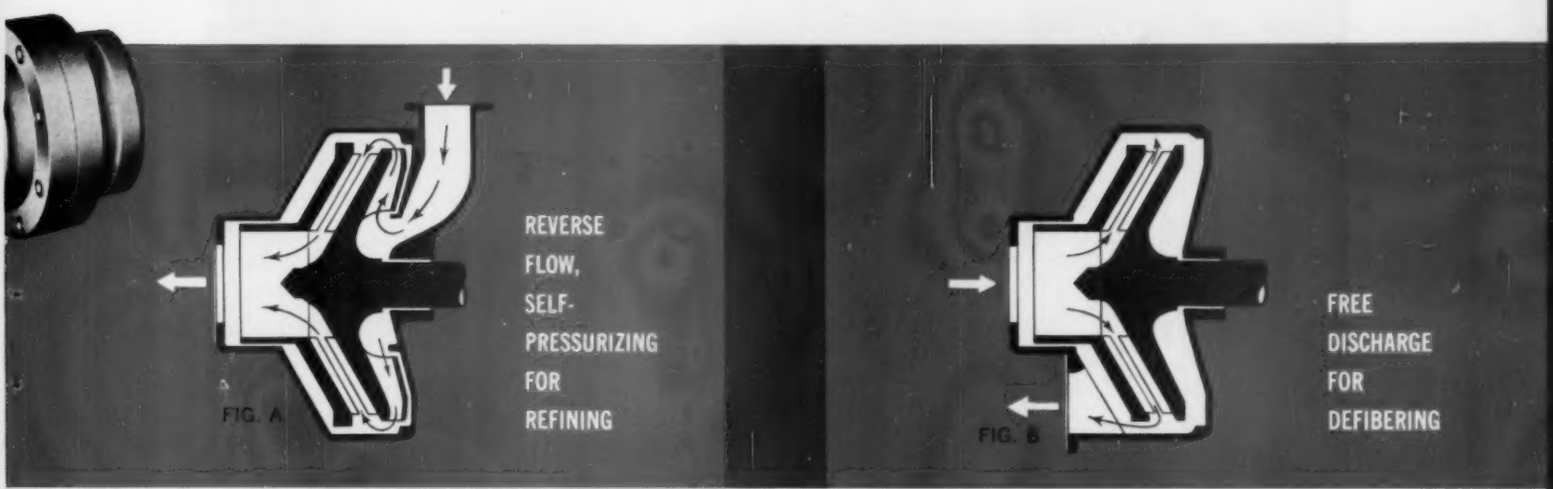


the all NEW MORDEN DISCO FINER

one versatile machine that provides: amazing precision · tremendous productive capacity · self-pumping, self-pressurizing · low power per ton of production · unlimited adaptability for production

HERE, at last, is a truly significant NEW development in stock preparation equipment. Simple flow and filling changes adapt the new DISCO-FINER so that it will either defiber or refine. Because plates are *self-aligning,* as the result of a new principle in refiner design, this equipment operates with amazing precision. The self-aligning semi-conical design of rotor and stator plates overcomes warpage or distortion. The new DISCO-FINER is engineered to deliver high production without any sacrifice of quality. It is modern in every respect.

All parts are designed to withstand many times the stresses of normal use so that precision is maintained under all conditions. Easy-to-remove housing makes plates readily accessible.



HOW THE REVOLUTIONARY MORDEN SELF-ALIGNING SYSTEM ASSURES PRECISION

In conventional flat disc design, it is diffcult to maintain alignment because of shaft deflection and bearing clearances. Morden's creative engineering has overcome this disadvantage in disc refining through semi-conical plate design. The new design assures plates are maintained in perfect relationship to one another. This feature makes rotor and stator plates align automatically.

Mordenize › Send for information on Morden's complete line of pulpers, refiners and jordans . . . the standard of high quality in the industry.

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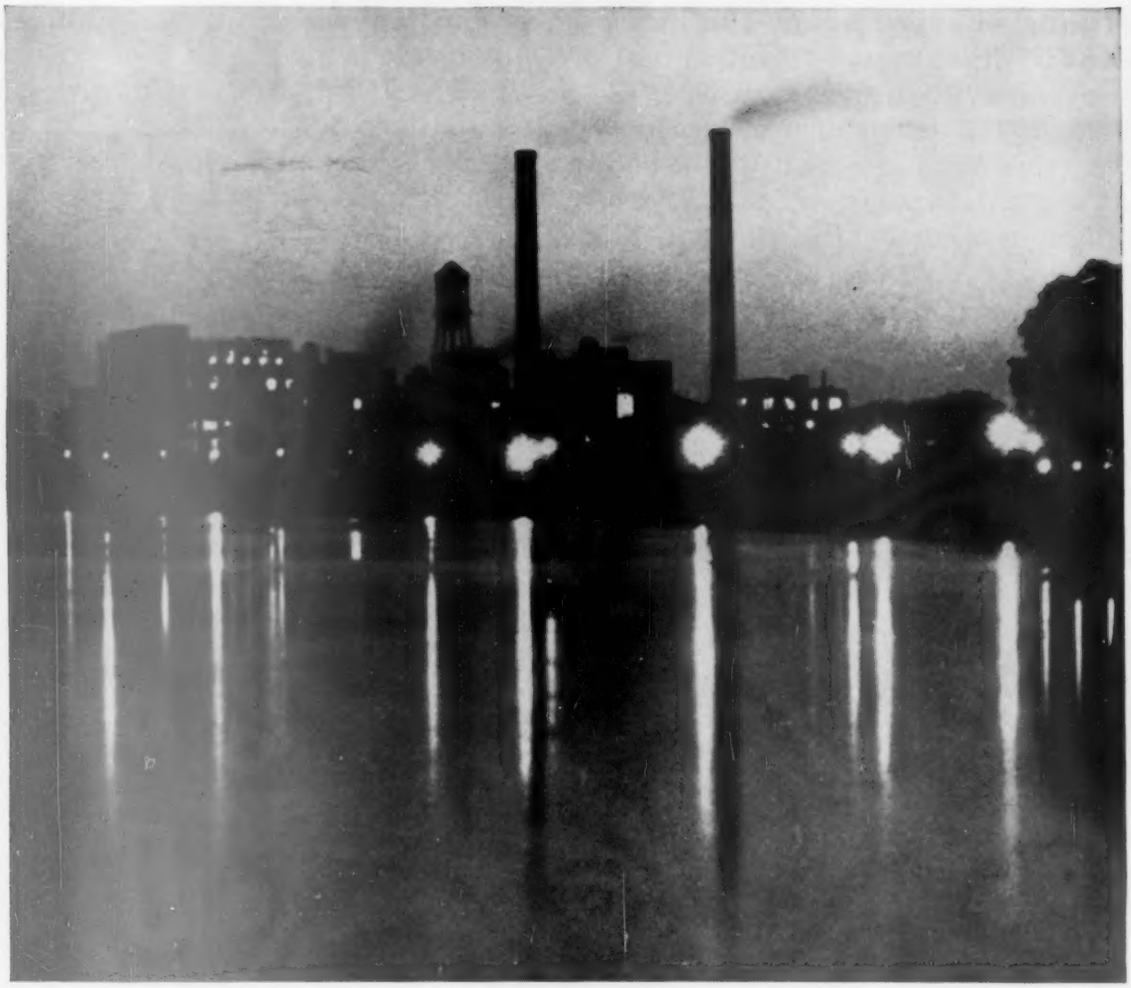
UNITED STATES REPRESENTATIVES: Midwest, Dan B. Chapman, Appleton, Wis. • Northeast, Orton Corporation, Fitchburg, Mass.

COMPARE THESE FEATURES WITH THOSE OF ANY OTHER DISC REFINER

Once you have checked these Morden features, we are sure you will agree Morden has made a major contribution in modern stock preparation:

1 High production with precision treatment.
2 Low power per ton of production.
3 500 to 700 connected horsepower.
4 Easily adapted for defibering or refining.
  a. Reverse flow, self-pressurizing for refining. (See Fig. A above.)
  b. Free discharge for defibering. (See Fig. B above.)
5 Variety of plate designs and materials.
6 Precise plate adjustment.
7 Standard bearings and coupling.
8 Low maintenance.

Before you order another machine for stock preparation, see all the data on DISCO-FINER. Write for detailed information about the advantages of the Morden self-aligning design.



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CLINTON TECHNICAL SERVICE is freely available upon request.

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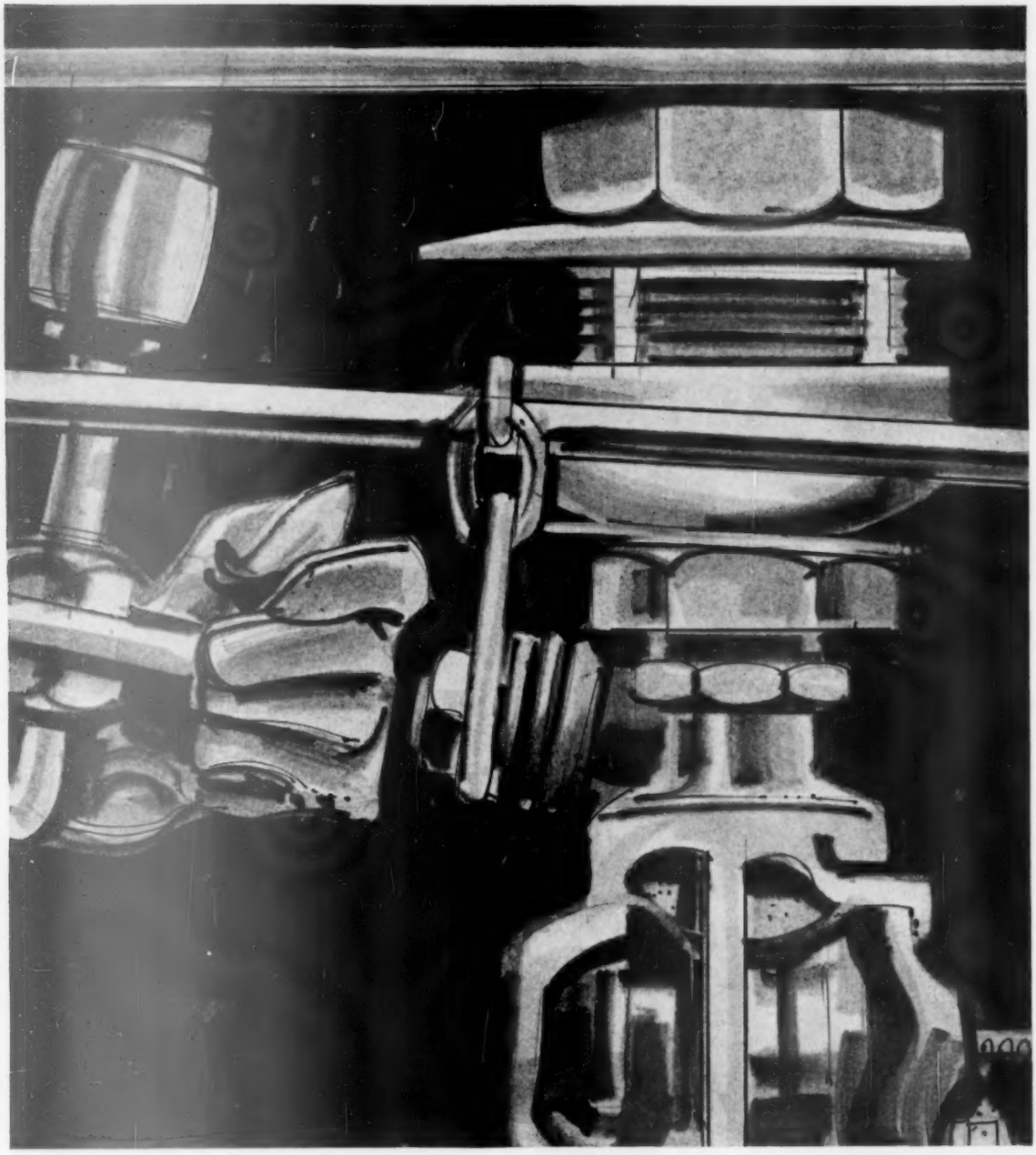

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We can instruct your personnel in the best methods for unloading the various chemical carriers. Such help moves in two directions: safe procedures, and methods for achieving maximum efficiency in unloading. We also provide well-illustrated literature on such subjects. Just ask.

The CAUSTIC SODA ENGINEERING AND HANDLING GUIDE carries many pages on the unloading and handling of this alkali. There are illustrations on the methods of unloading tank cars. Also sections on handling, storage, safety and the like.

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CHEMICALS
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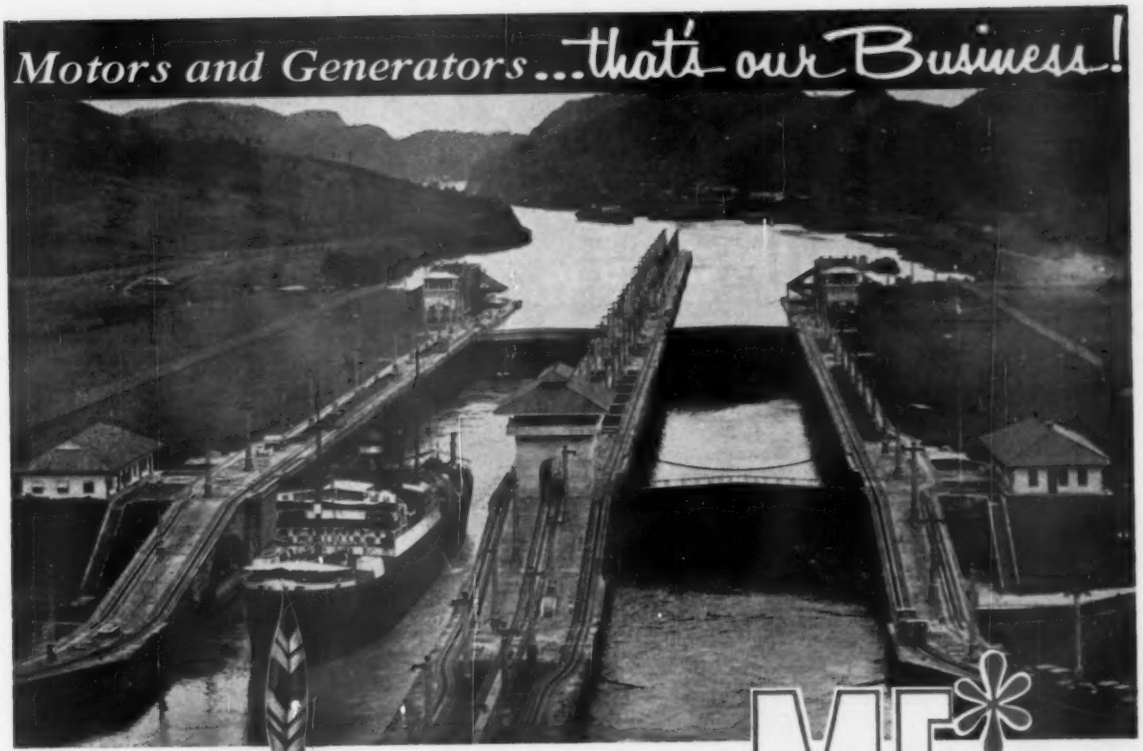

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This data and specification file on Marathon Electric Motors and Generators is now available for your ready reference use. May we mail you your free copy now?

* Marathon Electric MANUFACTURING CORPORATION

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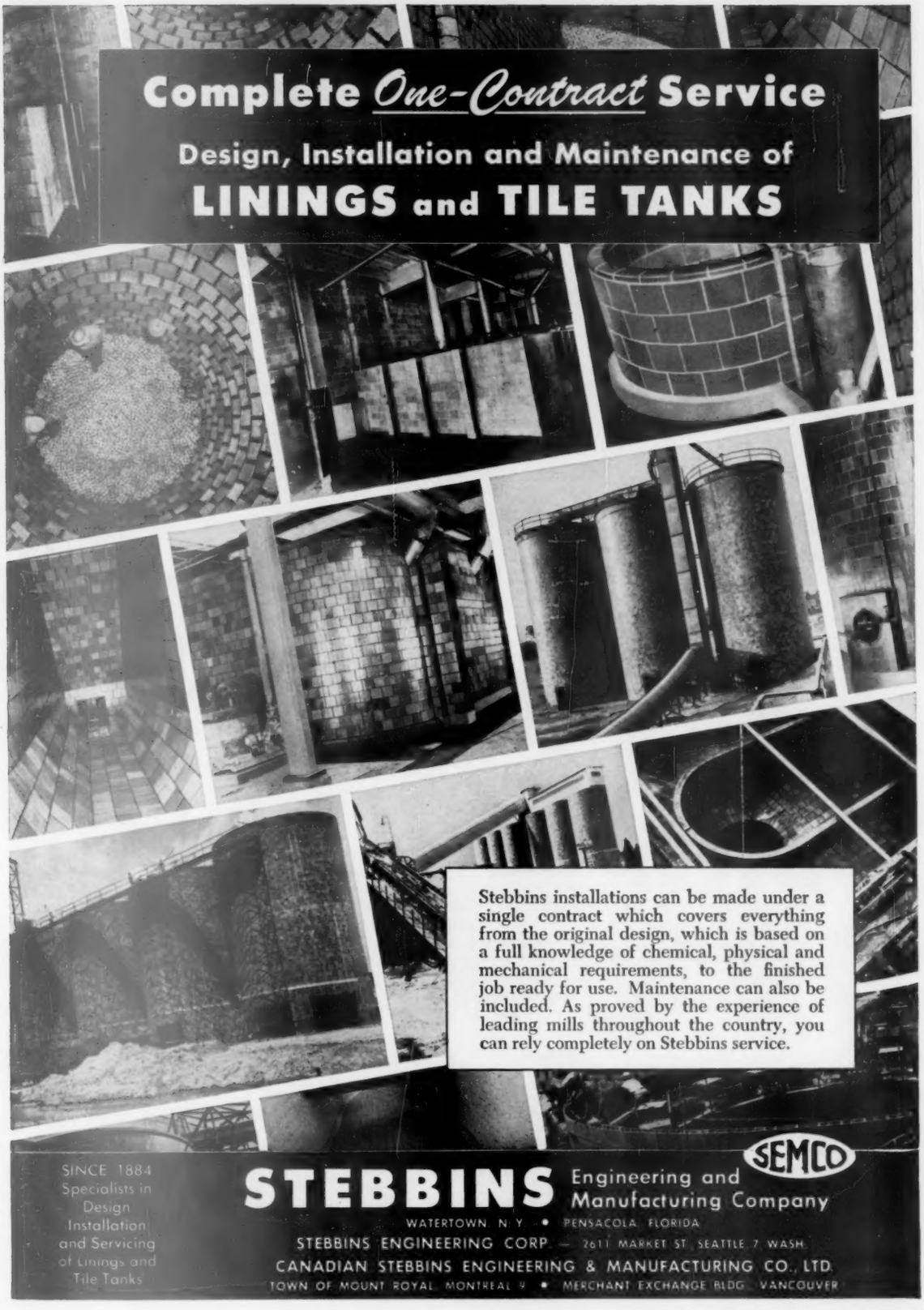
Factories at Erie, Pa., and Earlville, Illinois

Offices in Principal Cities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Stebbins installations can be made under a single contract which covers everything from the original design, which is based on a full knowledge of chemical, physical and mechanical requirements, to the finished job ready for use. Maintenance can also be included. As proved by the experience of leading mills throughout the country, you can rely completely on Stebbins service.
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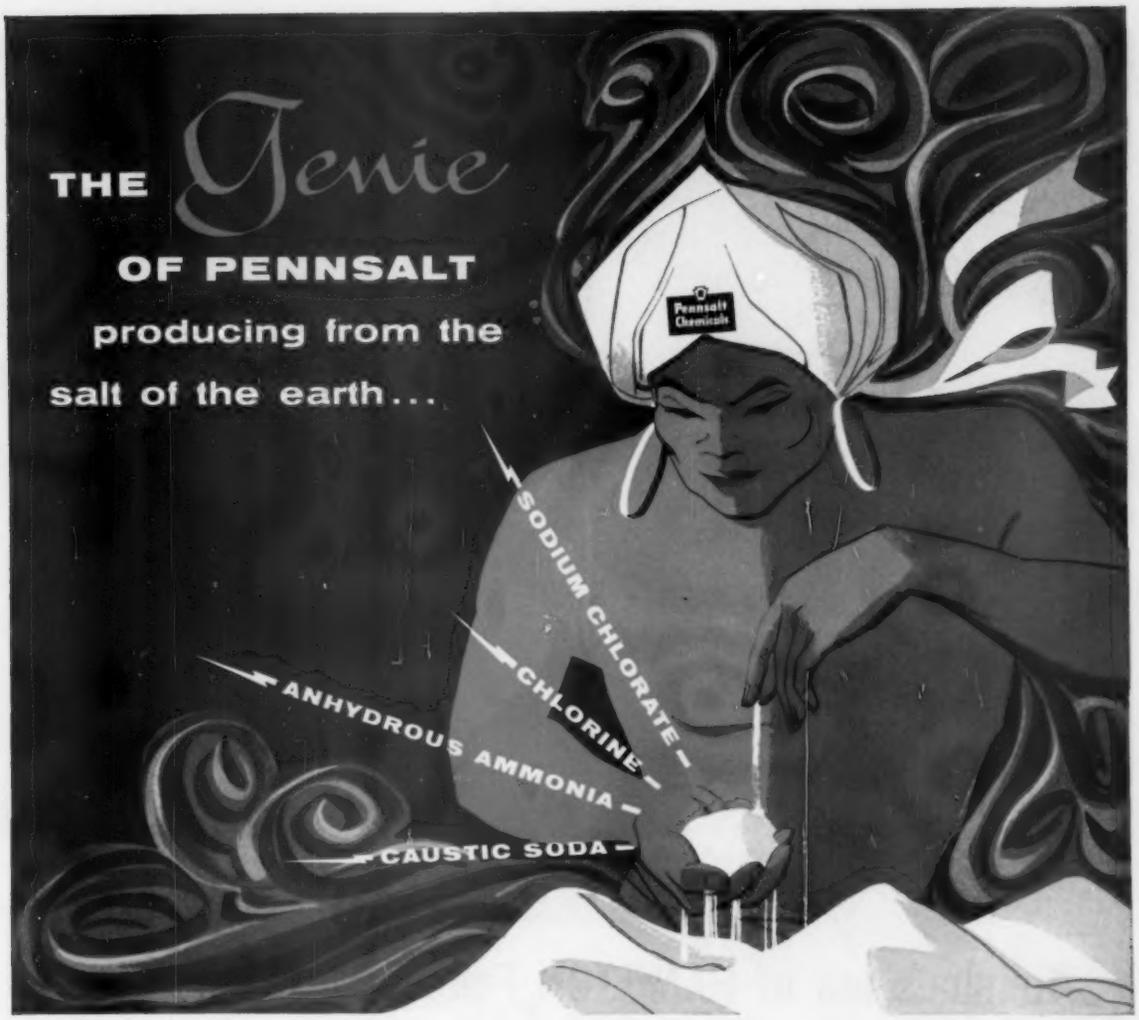

4 basic chemicals for obtaining higher yield and greater brightness in the manufacture of pulp

High pulp brightness—to 90 . . . high yield . . . increased production and better utilization . . . these are what the PENNSALT genie creates from salt . . . basic chemicals for better, brighter pulp.

Pennsalt's two plants on the Pacific Coast can provide fast and dependable service to Alaska, Western Canada and Western United States. Its Technical Service Department is available for consultation on safe practices, and technical and engineering advice on the handling, storage and process application of these chemicals in pulp refining.

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PENNSALT CHLORINE and CAUSTIC SODA are made at Calvert City, Ky., Portland, Ore., Tacoma, Wash., Wyandotte, Mich., and Mexico City.

Pennsalt Chemicals
ESTABLISHED 1850

*Submitted by: H. C. BEMENT, 10026 Klingerman St., El Monte, Calif.

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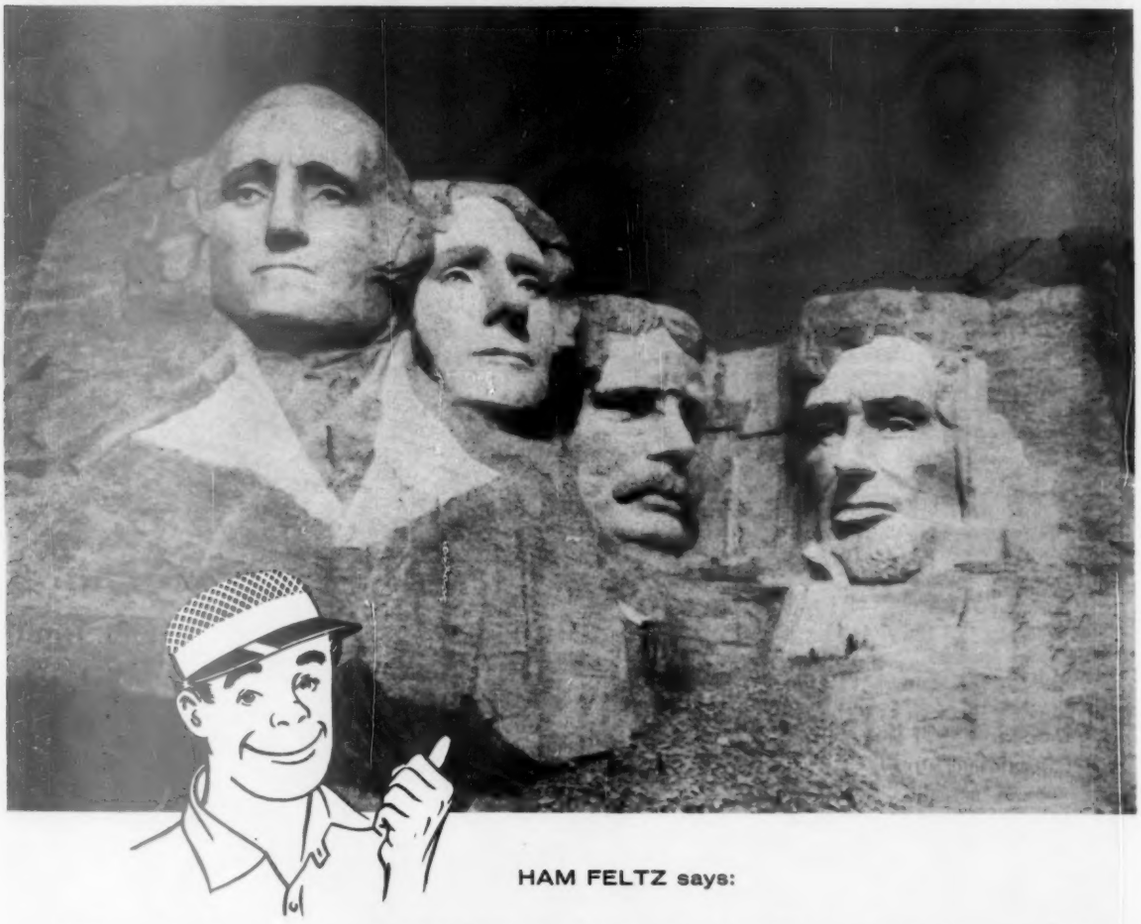

HAM FELTZ says:

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"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every U.S. papermaker entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

"The Mt. Rushmore National Memorial in the Black Hills has an altitude of 6,200 feet. Sculptured in the granite face of this mountain are the heads of Washington, Jefferson, Lincoln and Theodore Roosevelt. It's the biggest in the U. S. A. — just as our new giant loom is the biggest — 6½′ wider than any other in America . . . installed in anticipation of the day when *you* will need wider felts.

This is just another of the modern, meaningful forward moves at Shuler & Benninghofen that guarantee you the best felts to solve *your* specific need."

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WORLD'S LARGEST FAMILY OF VALVES

performance makes the world of difference

POWELL DEPENDABLE VALVES

With their advanced design, sturdy construction, and conforming to latest valve standards, Powell Valves can be depended upon for consistently satisfactory service with little or no maintenance. If you have a valve problem or an unusual flow control condition in the handling of water, oil, gas, air, steam, corrosive fluids, our engineers will gladly help you solve it. Check with your nearby Powell Valve distributor—or write to us.

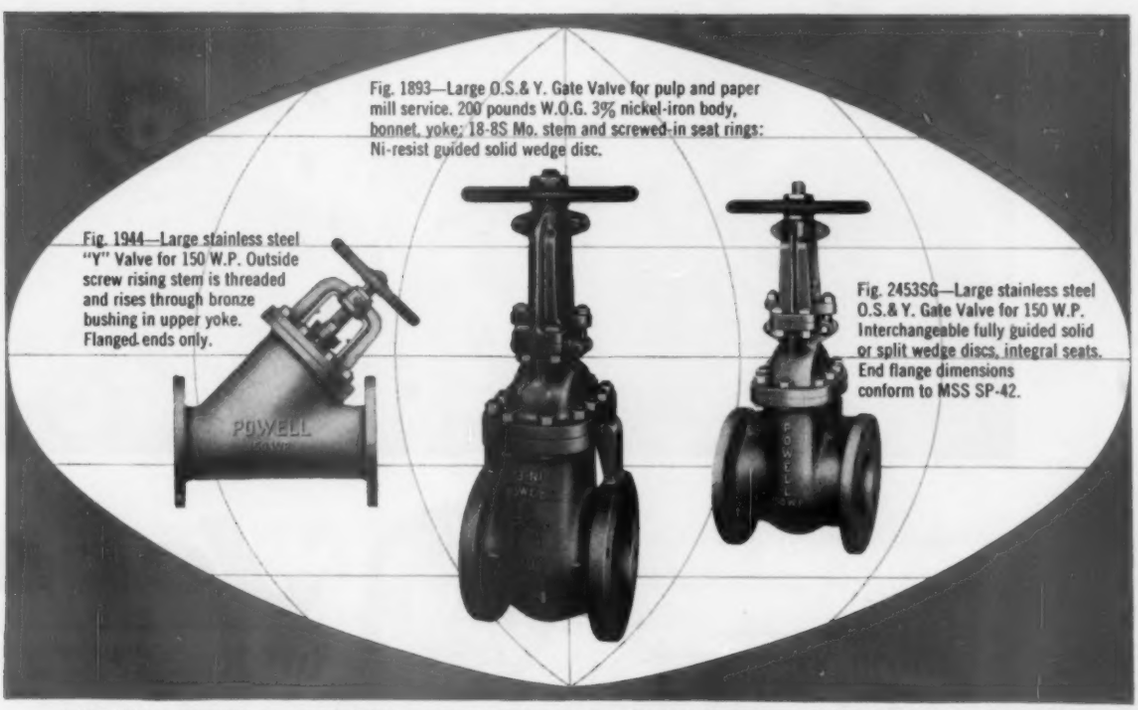
Fig. 1893—Large O.S.& Y. Gate Valve for pulp and paper mill service. 200 pounds W.O.G. 3% nickel-iron body, bonnet, yoke; 18-8S Mo. stem and screwed-in seat rings; Ni-resist guided solid wedge disc.
Fig. 1944—Large stainless steel "Y" Valve for 150 W.P. Outside screw rising stem is threaded and rises through bronze bushing in upper yoke. Flanged ends only.
Fig. 2453SG—Large stainless steel O.S.& Y. Gate Valve for 150 W.P. Interchangeable fully guided solid or split wedge discs, integral seats. End flange dimensions conform to MSS SP-42.
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Jones Pulpers

PICKED FOR PERFORMANCE IN THE NATION'S NEWEST MILLS

E. D. JONES CORP. · S. PITTSFIELD, MASS. · member BELOIT group

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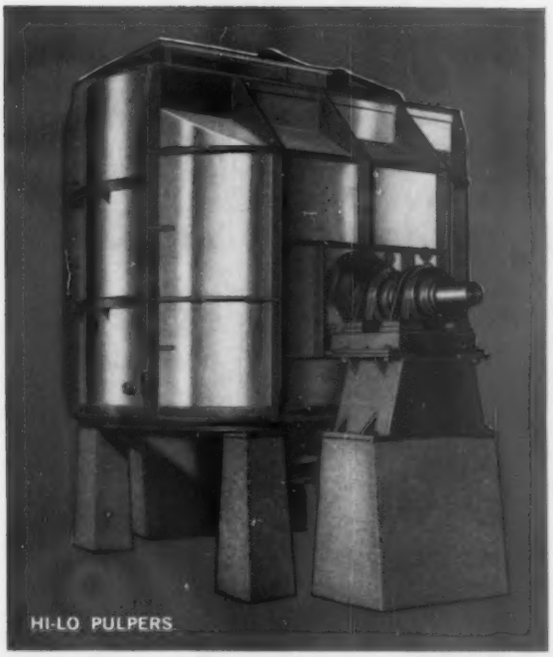
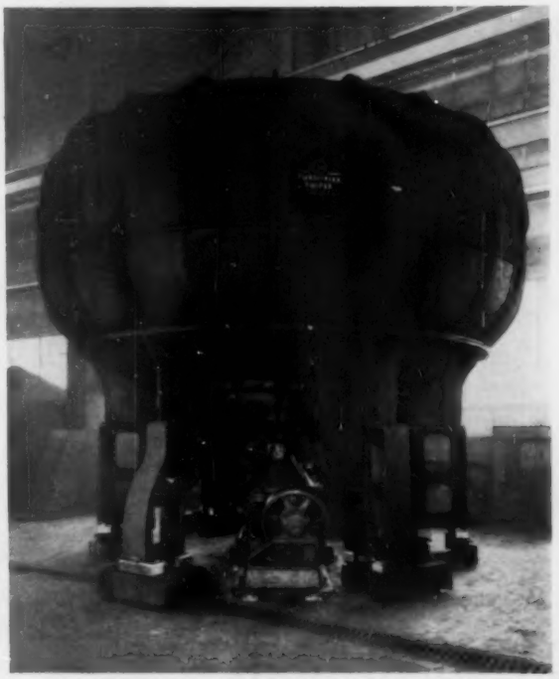
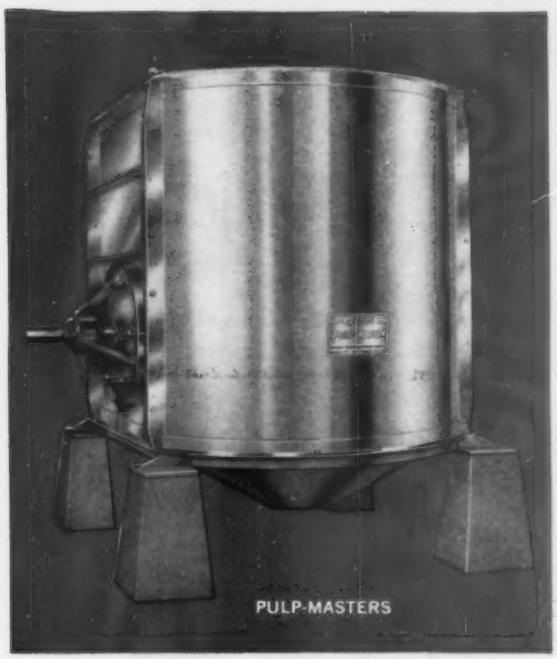


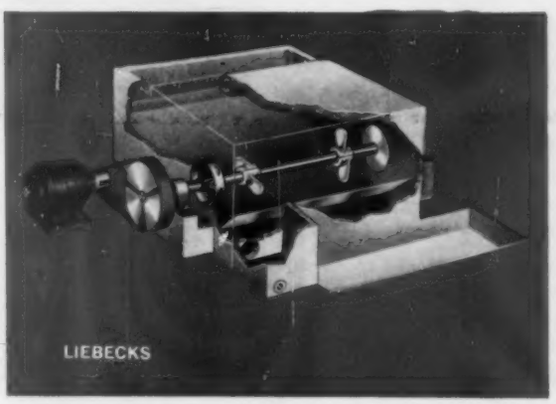
HI-LO PULPERS

TURBOFLEX — Latest addition to the line . . . proven by Fleck in mills throughout Canada and Europe . . . now built in the United States by Jones.





PULP-MASTERS



LIEBECKS

From coast to coast the managers of the country's most modern mills have chosen Jones equipment to handle their pulping needs — from initial slushing and defibering to broke repulping. Their reasons — *dependability, minimum downtime,* and the knowledge that Jones offers a *complete line* of pulping equipment. If you are thinking of modernizing, it will pay you to include Jones in your plans.

Which valve alloy for your next job?

When you next have a requirement for high alloy valves, especially for corrosion service, why not come to the company with the most experience in this field.

Aloyco has specialized in the manufacture of stainless steel valves, exclusively, for over 30 years.

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Offices in: Boston • New York • Wilmington Atlanta • Buffalo • Pittsburgh • Chicago St. Louis • San Francisco • Los Angeles

***These seven corrosion test specimens** are just a few from hundreds of tests conducted by Aloyco to insure our valve customers of the right alloy for their particular job. Aloyco valves are supplied in such metals as 304 and 316 stainless steel, Aloyco 20, Nickel, Monel and Hastelloy B, C and D.*

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VALVES
1ST IN CORROSIVE SERVICE

ALLOY STEEL PRODUCTS COMPANY
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BEST BY TEST!

Nichols Freeman 206 VORJECT® proves stock cleaning superiority in side-by-side test

Compare unretouched photographs below of actual hand sheets magnified three times. Get the additional advantages of Nerco "know-how".

1. **Stainless steel, with built-in wear resistance**
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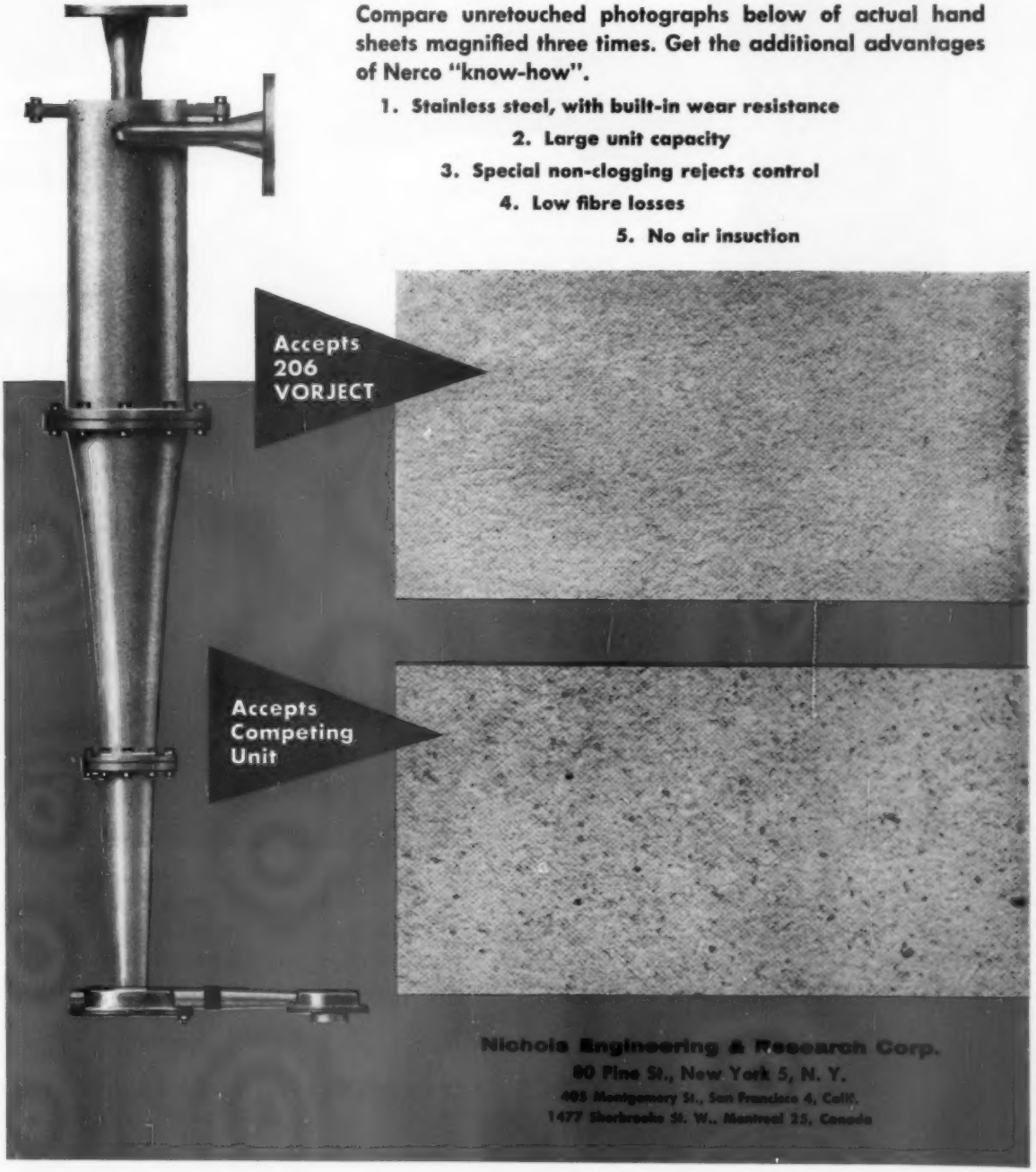

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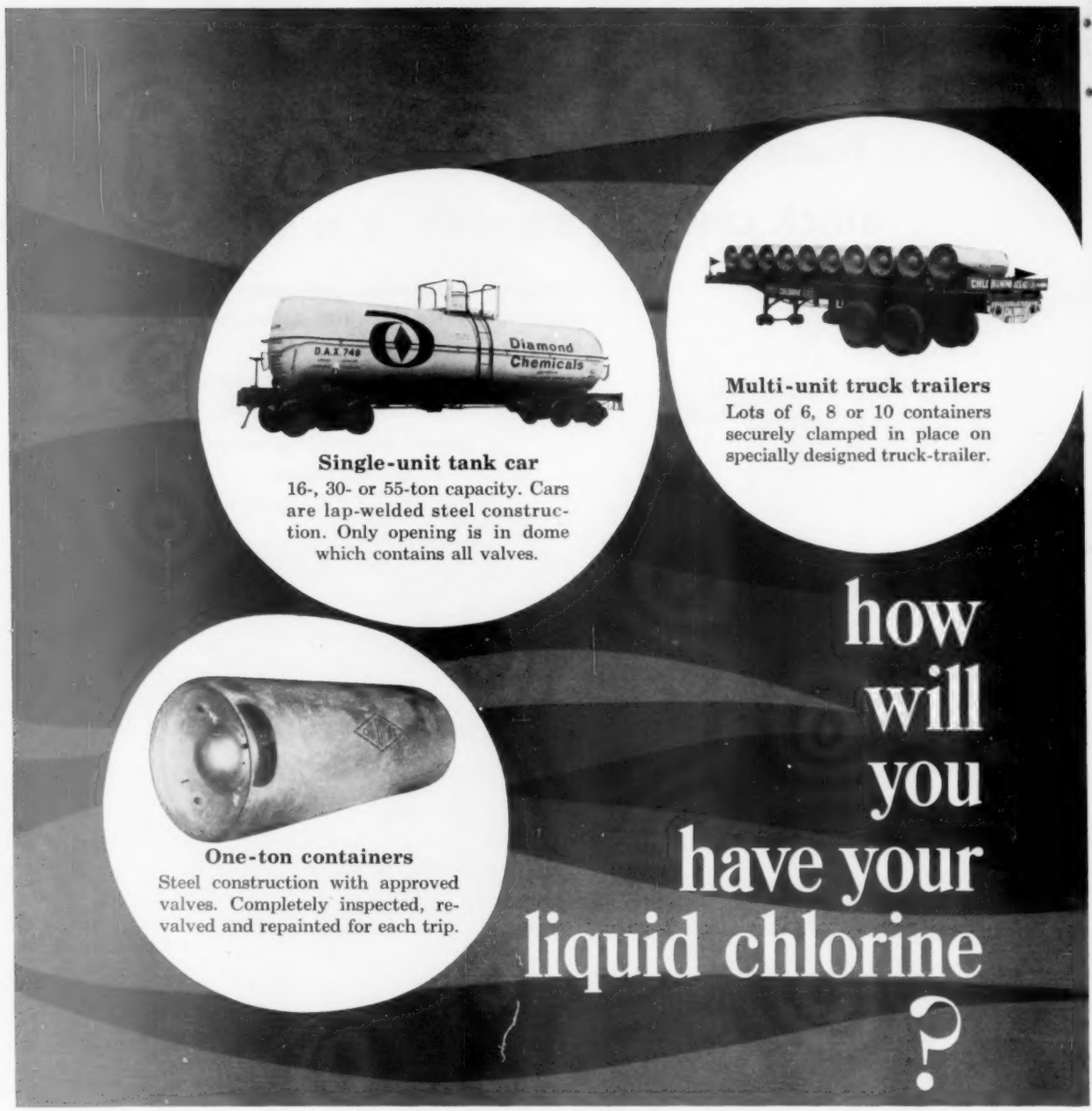
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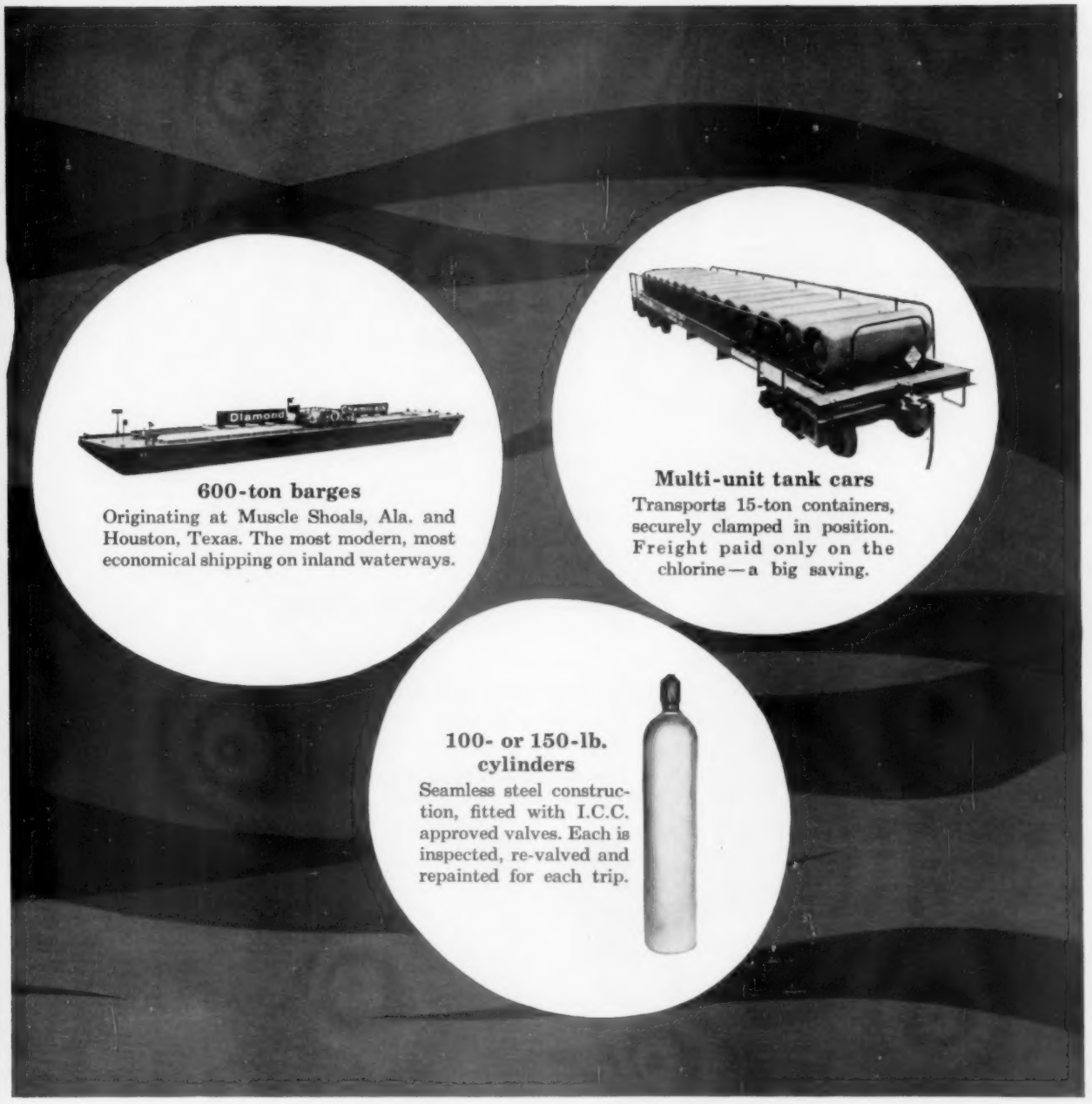
Chemicals
Single-unit tank car
16-, 30- or 55-ton capacity. Cars are lap-welded steel construction. Only opening is in dome which contains all valves.
Multi-unit truck trailers
Lots of 6, 8 or 10 containers securely clamped in place on specially designed truck-trailer.
One-ton containers
Steel construction with approved valves. Completely inspected, re-valved and repainted for each trip.
how will you have your liquid chlorine ?

Your source of Liquid Chlorine is the most important thing about it!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600-ton barges
Originating at Muscle Shoals, Ala. and Houston, Texas. The most modern, most economical shipping on inland waterways.
Multi-unit tank cars
Transports 15-ton containers, securely clamped in position. Freight paid only on the chlorine—a big saving.
100- or 150-lb. cylinders
Seamless steel construction, fitted with I.C.C. approved valves. Each is inspected, re-valved and repainted for each trip.

From Diamond, you get Liquid Chlorine where you want it . . . when you want it . . . in the quantities you want . . . at the lowest shipping cost . . . safeguarded by the most highly skilled technical service. You'll always be glad you're doing business with Diamond, one of America's largest producers. For the Diamond "Chlorine Handbook", write Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

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for domestic and world-wide
sales of pulp, paper,
paperboard and newsprint.

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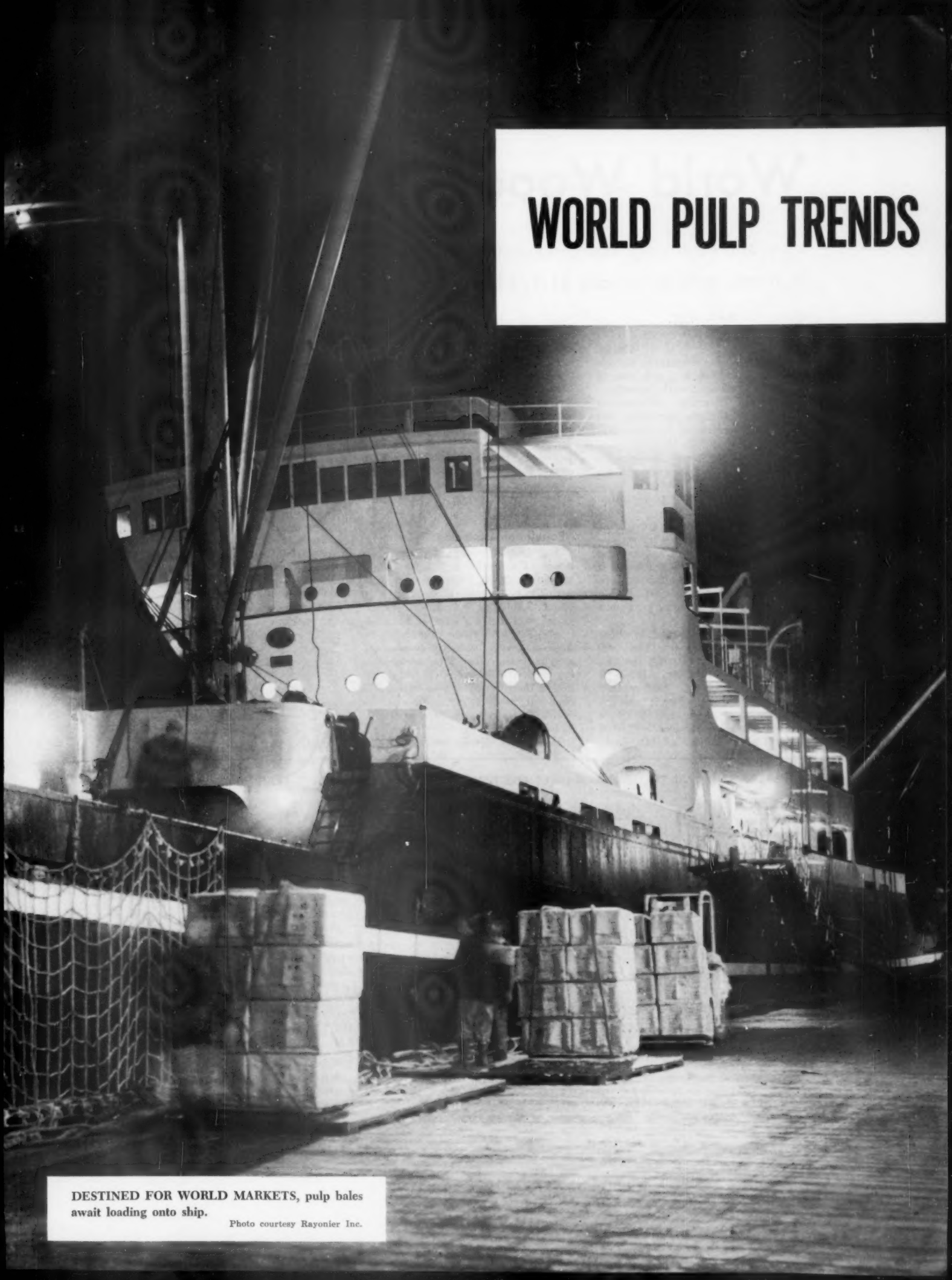
PULP PAPER EXPORT CNC

WOOD PULP G

ESTABLISHED 1886

100 PARK AVENUE NEW YORK 17, N. Y.

WORLD PULP TRENDS



DESTINED FOR WORLD MARKETS, pulp bales await loading onto ship.

Photo courtesy Rayonier Inc.

World Woodpulp Market

. . . shows strong improvement in Europe, especially. Rising demands in many nations create $1-1/4 billion cellulose business

By A.W.W.

–Zurich

● The very strong demand in Europe today for woodpulp is a reflection of genuine and sound growth. Elsewhere in the world the market situation for woodpulp is similarly improving but not as spectacularly as it has on this continent.

In these times it may be valorous but not wise to try to peer too far into the future. Yet there seem to be good reasons for viewing the future with reserved optimism.

Just a year ago in this review of the world's market pulp situation, we said: "Very definitely, Europe is on the threshold of tremendous expansion in pulp and paper consumption." In just the past few months a remarkable upward surge all through Europe has taken place.

For the past two years, in these columns, it has been frequently reported that percentagewise, the demand for pulp in Europe will rise at a more rapid pace than on the other continents and this picture is now unfolding in clear, sharp lines. Europe's consumption is under one-third that of the United states, but the European Common Market and the European Free Trade Area–the "Inner Six" and "Outer Seven" nations–are rapidly changing that situation by lowering of trade barriers and increasing business activity.

Government and other surveys of future demand for fibrous raw materials already are falling behind actual growth figures. Some of these estimated a 25 to 35% growth by 1975 over actual present consumption (1960) but it seems more likely the current requirements will be doubled in 15 years.

"Population Explosions"

Just imagine the paper and pulp needs of a world of 6 or 7 billion people in 2000 A D., as compared with the present world population of about 3 billion. Population "explosions" will be a powerful force in pushing ahead these requirements. Also a greater variety of uses for woodpulp and other fibers are emerging from the laboratories. The pulp mill of the future will be a variegated chemical products establishment, as it already is, to a considerable extent, in Europe.

In the less developed countries of Asia, Africa and Latin America, peaceful and violent revolutions are taking place. These cannot be conducted without paper, in either case. The peoples of these nations will insist on having the pulp products which are regarded as essential to a better life in Europe and America–and many products still regarded as luxuries even in the advanced countries This demand for the products of fibrous raw materials may grow even more rapidly in those countries than many observers expect. For example, in Russia where paper consumption is only about 30 lbs. per person; in China, only 4 lbs ; in India, 2 lbs , as compared with 435 lbs. in the U.S.A. last year.

Advances in Silviculture

A sobering side to this picture is the problem of a continuing raw material supply. In the U.S.A. and in Europe, the conventional softwoods can never keep up with the demands for woodpulp. Fortunately in both Europe and North America, hardwoods are being increasingly used. Most new mills today are based on faster growing hardwoods, and fortunately, the scientists of the industry

1959—PRINCIPAL STATISTICS—MARKET AND NON-MARKET CHEMICAL PULP—LEADING COUNTRIES

In short tons of 2,000 lbs.

	Sweden	*U.S.A.*	*Canada*	*Finland*	*Norway*
PRODUCTION:					
All Chemical Pulp	3,628,689	19,633,038	4,935,375	2,368,646	747,512
Dissolving & Special Alpha	396,955	1,091,859	363,569	169,388	145,260
Chemical Paper Grades	3,231,734	18,541,179	4,571,806	2,199,258	602,252
DOMESTIC CONSUMPTION:					
All Chemical Pulp	1,377,306	20,398,235	2,782,122	1,026,976	414,117
Dissolving & Special Alpha	39,831	81,677*	56,489	17,893	18,212
Chemical Paper Grades	1,337,475	20,316,558	2,725,833	1,009,083	395,905
EXPORTS:					
All Chemical Pulp	2,435,554	599,480	2,199,872	1,452,659	338,457
Dissolving & Special Alpha	372,724	285,707	295,618	158,980	130,646
Chemical Paper Grades	2,062,830	313,773	1,904,254	1,293,679	207,811
INVENTORIES, DEC. 31, 1959.					
All Chemical Pulp	227,871	717,891	136,771	108,931	16,943
Dissolving & Special Alpha	34,442	83,262	22,580	6,709	2,331
Chemical Paper Grades	193,429	634,629	114,191	102,222	14,612

*Exclusive of rayon and other non-paper mills.

This table has been compiled by this publication from reports from Swedish Cellulose Assn., U.S. Pulp Producers Assn., Inc., Canadian Pulp & Paper Assn., Norwegian Cellulose Assn., and Finnish Cellulose Assn.

Note–Most market pulp produced in U.S. is sold within its borders, and there are variations in other countries. For data on market pulp exclusively see other tables in this section. Export data in this table includes exports of subsidiaries to parent companies in other countries, as well as market pulp exports (i.e., from Canadian subsidiaries to U.S. mills).

are making quality pulps from this wood for all purposes. Many research institutions are developing superior strains of trees, in the way the farmers developed superior pigs and cattle. In Japan, gibberellic acid has performed miracles of growth and fertilization of forests in a newly developing science.

To meet world pulp needs, more than the usual wood species must be converted. While straw pulp mills are declining in number in the U.S.A., replaced by hardwood mills, the trend is just the opposite in France, Germany, Italy, Russia, Greece, Hungary, Yugoslavia and Egypt, where straw mills are springing up.

In countries where the usual wood species are not plentiful, cane baggasse, reeds and bamboo, and such novelties as wattle wood in South Africa and banana grass in Latin America, have been brought into service to provide the world's growing cellulose appetite. More and more countries, in these days of developing national industries, will be making more and more of their own pulp requirements, but this is not likely to reduce the international commerce in woodpulp now in the range of one and one-quarter billion dollars a year.

COMPARATIVE WORLD SHIPMENTS OF PAPER GRADE MARKET CHEMICAL PULP*

(In thousands of short tons)

Originating Country		*Sulfite*		*Sulfate*		*Total*
		Bleached	*Unbleached*	*Bleached*	*Unbleached*	
U.S.A.	1959	531.5#	47.5	732.3	141.3	1,452.6
	1958	493.6#	51.5	668.6	139.6	1,353.3
% Change in	1959	+7.7%	−7.7%	+9.5%	+1.2%	+7.3%
Canada	1959	351.1#	240.4	805.8	216.3	1,613.6
	1958	379.0#	242.7	635.9	183.6	1,441.2
% Change in	1959	−7.3%	−0.9%	+26.7%	+17.8%	+12.0%
Sweden	1959	608.2	520.0	657.4	637.2	2,422.8
	1958	523.1	512.1	526.3	481.2	2,042.7
% Change in	1959	+16.3%	+1.6%	+24.8%	+32.4%	+18.5%
Finland	1959	259.5	476.8	150.7	498.0	1,385.0
	1958	217.0	464.5	123.4	426.6	1,231.5
% Change in	1959	+19.6%	+2.6%	+22.2%	+16.7%	+12.5%
Norway	1959	227.6	47.1	17.5	22.7	314.9
	1958	225.1	50.8	16.4	24.6	316.9
% Change in	1959	+1.1%	−7.3%	+6.7%	−7.7%	−0.6%
Total	1959	1,977.9	1,331.8	2,363.7	1,515.5	7,188.9
	1958	1,837.8	1,321.6	1,970.6	1,255.6	6,385.6
Tons Increase:	1959	140.1	10.2	393.1	259.9	803.3
% Increase:	1959	7.6%	0.8%	19.9%	20.7%	12.6%
Sweden's Share of the 1959 Increase:						
Tons Increase		85.1	7.9	131.1	156.0	380.1
% of Total Increase		60.7%	77.5%	33.4%	60.0%	47.3%

*Includes domestic sales and all export sales.
#Includes Soda Pulp

Source: Assn. of Pulp Consumers, Inc.

Price Increases

European prices for woodpulp are now in line with those in the United States for the first time in two years. Bleached pulps were raised $5 for the third quarter beginning in July and there have been two raises this year for the unbleached pulps. Rising labor costs and new taxes in Scandinavia have brought its production costs close to those in America. A serious development today in Europe is the shortage of labor in many countries and one hears of this situation frequently in connection with many industries.

More and More Integration

Integration of pulp with paper and paperboard is a trend which promises to have a most important influence on the world market pulp supply situation. In Europe and United States and Canada it is tending to correct previous situations of over-capacity and it is doing so quite rapidly, especially in the sulfate woodpulp grades. Even among the major market woodpulp producers of Sweden, Finland, U.S.A. and Canada, several "big name" pulp companies have acquired or built papermaking operations in the past year.

Today there are only two pulp companies in the U.S.A. (and both are normally primarily dissolving pulp suppliers) which do not have their own paper or paperboard mills. The trend has expanded into Canada. It has received considerable impetus in Scandinavia this year. It marks a considerable reversal of the situation which prevailed 10 or 15 years ago when there were a considerable number of companies which made only woodpulp for market. How far and how fast will this trend advance? One thing is certain—it shows no inclination to halt or even slow up.

At the same time, it is significant that Bowaters of Britain, with its second venture in the United States (its Catawba, S.C., plant) and Japan, with its first pulp investment in North America (the Alaska Lumber & Pulp Co., Sitka, Alaska) have added two more new pulp market mills, over 200,000 tons, to world market pulp supply. Sweden and Finland also are adding pulp capacity for market. Actually, market pulp demand, as this is written, was running about 4% above a year ago—a healthy increase.

In Europe, before recent price rises, there was some buying for inventory. But, generally, the bottom of inventory stockpiling seems to have been reached and there is, especially in Europe, a rush to buy pulp for current needs This is spurred along by the lack of any weakness in price —in fact the recent increases have made up for the reductions a year ago, which some pulp marketers are convinced were unnecessary. The Scandinavians, up into midyear of 1960, were showing a strong interest, also, in the American market.

Leading Exporters of Pulpwood

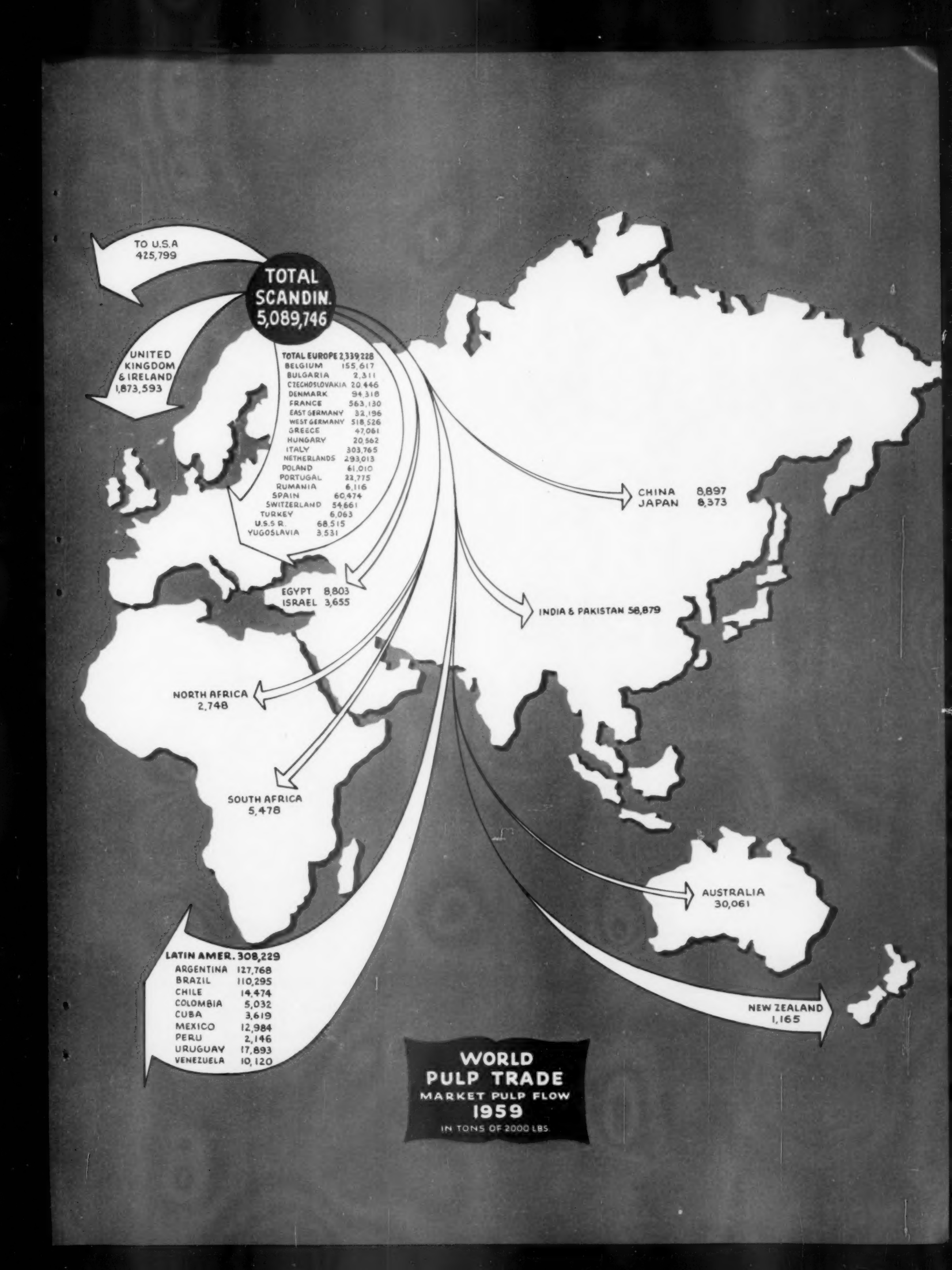
The Market Pulp Trends map, a special feature each year of this section of the Review Number, again shows the Scandinavian countries far in the lead as exporters of market woodpulp. Their total figure for 1959, as compiled for this map, is over five million tons.

Canada exported a little less than half as much as the Scandinavian nations. Its total was 2,450,027 tons, but nearly 2,000,000 of this went to the U.S.A., in many cases to parent companies. This was an 11% increase in Canadian exports—23% of all its pulp.

The exports by the United States reached 652,437 tons, of which 390,751 tons went to Europe. U.S. exports are increasing this year at a rate of more than 100%, up to mid-year.

In all cases the exports of these three leading pulp marketing areas set new all-time records. This, of course, included both dissolving and paper pulps. Actually, there was a

ASIA, AFRICA, PACIFIC 120,767
JAPAN 47,301 KOREA 7,357
AUSTRALIA 13,410 INDIA 23,123
PHILIPPINES 15,197 PAKISTAN 5,600
TAIWAN 8,044 UN. OF S. AFRICA 735
EUROPE 266,627
UNITED KINGDOM 217,336 ITALY 12,593
BELGIUM 6,688 SWITZERLAND 2,685
FRANCE 18,027 SPAIN 696
NETHERLANDS 8,148 IRELAND 454
TOTAL CANADA 2,450,027
TO U.S.A. 1,996,481
TO CANADA 56,833
ASIA, AFRICA, PACIFIC 92,257
AUSTRALIA 11,872 KOREA 5,905
CEYLON 604 MOZAMBIQUE 696
EGYPT 1,099 PAKISTAN 1,120
INDIA 5,844 PHILIPPINES 13,287
ISRAEL 623 TAIWAN 3,755
JAPAN 46,415 UN. OF S. AFRICA 990
EUROPE 390,751
UNITED KINGDOM 161,536
AUSTRIA 1,283 ITALY 41,695
BELGIUM 14,941 NETHERLANDS 23,209
DENMARK 330 SPAIN 2,756
FRANCE 38,030 SWEDEN 4,588
W. GERMANY 94,126 SWITZERLAND 6,527
IRELAND 1,390 YUGOSLAVIA 287
TOTAL U.S.A 652,437
TO MEXICO 19,984
LATIN AMER. 112,596
ARGENTINA 4,849
BRAZIL 2,068
CHILE 9,331
COLOMBIA 18,713
CUBA 31,640
GUATEMALA 445
PERU 2,671
URUGUAY 1,780
VENEZUELA 21,115
LATIN AMERICA 63,813
CHILE 13,881
PERU 4,136
COLOMBIA 19,284
URUGUAY 503
VENEZUELA 16,184
ARGENTINA 3,362
MEXICO 5,383
CUBA 1,080


TO U.S.A
425,799
TOTAL SCANDIN.
5,089,746
UNITED KINGDOM & IRELAND
1,873,593
TOTAL EUROPE 2,339,228
BELGIUM 155,617
BULGARIA 2,311
CZECHOSLOVAKIA 20,446
DENMARK 94,318
FRANCE 563,130
EAST GERMANY 32,196
WEST GERMANY 518,526
GREECE 47,061
HUNGARY 20,562
ITALY 303,765
NETHERLANDS 293,013
POLAND 61,010
PORTUGAL 23,775
RUMANIA 6,116
SPAIN 60,474
SWITZERLAND 54,661
TURKEY 6,063
U.S.S.R. 68,515
YUGOSLAVIA 3,531
CHINA 8,897
JAPAN 8,373
EGYPT 8,803
ISRAEL 3,655
INDIA & PAKISTAN 58,879
NORTH AFRICA
2,748
SOUTH AFRICA
5,478
AUSTRALIA
30,061
NEW ZEALAND
1,165
LATIN AMER. 308,229
ARGENTINA 127,768
BRAZIL 110,295
CHILE 14,474
COLOMBIA 5,032
CUBA 3,619
MEXICO 12,984
PERU 2,146
URUGUAY 17,893
VENEZUELA 10,120
WORLD
PULP TRADE
MARKET PULP FLOW
1959
IN TONS OF 2000 LBS.

slight decline in U.S. paper pulp exports, but they were rising rapidly again in 1960.

The British Isles received 1,873,000 tons from Scandinavia's total of five million. Next best Scandinavian customers were France, 563,000 tons, West Germany, 518,500 tons, and United States, 425,799.

The British Isles received 218,000 tons from Canada and 162,000 from U.S.A.

The United States' next best customers were West Germany, 94,000, Japan, 46,000, Italy 41,600, and France, 38,000. Canada's next best customers, after the mother country were Japan, 47,000, India, 23,000, Colombia, 19,200 and France, 18,000.

The Latin America market bought 308,000 tons from Scandinavia, 112,600 from the U.S.A., and 63,800 from Canada.

As for Asia, Africa and Australia, the market is, surprisingly, quite evenly divided amongst the great supply areas. About 127,000 tons came from Scandinavia, about 120,000 from Canada and 92,250 from the U.S.A.

What Will Russia Do?

A big question mark in the world market pulp picture is Soviet Russia. Its exports will run from 200,000 to 300,000 tons a year, according to officials of that country with whom the writer talked on a visit to Moscow about a year ago. The man who heads up control of the export of all wood and wood products is Vlas Nichkov, with whom the writer had an interview. He contends Russia will want its pulp to make paper for upgrading the living conditions of its own people.

Russia, however, has demonstrated that it can go heavily into exports in various world trade commodities when it wishes, and it is quite possible it may, in some years, do the same with pulp. In fact, many European marketers and buyers of pulp believe that there will be a need for Russian unbleached grades to supplement the higher qualities purchased from Scandinavia and America in future years.

The president of Canada's Pulp and Paper Association predicts that in a few years Russia will become a major competitor of Canada in paper and pulp exports. Our own observations of the status of the Russian pulp and paper industry, made while visiting that country, is that it will take a number of years for Russia to catch up with the leading Western countries—it may take ten years to catch up with U.S.A. paper production for instance. But in less time, it is possible that substantial amounts of Russia pulp can be consigned to export markets.

Other Market Pulp Nations

West Germany and Austria are important woodpulp exporters. Switzerland has two market pulp mills, Portugal has one such sulfite mill. Japan has shipped some pulp to Australia, and New Zealand is a supplier for Australia. Czechoslovakia and Yugoslavia are other nations which figure in world pulp trade, and in some years, in important or, at least, strategically important, amounts. The data on pulp exports for these and other countries may be found in their sections in this Review Number.

Swedish Pulp to 40 Countries

Little Sweden alone exported about three-fifths of all the market woodpulp of the Scandinavian countries in 1959. Its total exports were 2,953,000 short tons in 1959, about a half million more tons than the No. 2 nation—Canada. Whereas Canada's go mostly to the U.S.A., the Swedish marketers of pulp, most experienced in the world, send their pulps to more than 40 countries in every corner of the world. The 1959 shipments by Sweden were 355,000 tons more than were shipped by that country in 1958. There could be a similar increase of Swedish shipments in 1960 over 1959.

Their markets for chemical cellulose alone—foreign and domestic—may rise to 2,700,000 tons in 1960. Recent surveys of forest resources in Sweden, taking into account hardwoods as well as the softwoods, are much more optimistic than those made some years ago. There is an over-abundance of wood in North and South, but a shortage in the middle provinces. It is possible that Sweden may be able to increase its total pulp production, for domestic use and for market, by as much as 5,000,000 tons in the next five years.

WORLD PRODUCTION OF BLEACHED PULP EXCEEDS 15,000,000 TONS

Country	*Sulfite*	*Kraft*	*Dissolving (Sulfite and Kraft)*
Argentina	8,000	11,000	—
Australia	—	24,600	—
Austria	265,700	7,200	—
Belgium	15,000	—	—
Brazil	72,000	8,000	—
Canada	770,670	1,149,980	507,225
Chile	—	25,400	—
Finland	569,000	243,000	—
France	66,100	170,800	60,600
Germany	440,000	—	—
Italy	77,600	—	57,107
Japan	250,000E	116,317	615,300
Mexico	—	80,500	—
New Zealand	—	27,000	—
Norway	668,000	25,000E	—
Portugal	11,000	9,900	—
Spain	—	65,000E	—
Sweden	656,843	585,016	392,224
Turkey	10,000	—	—
U. So. Africa	—	93,000	—
United States	2,335,138	3,204,942	1,908,000
Totals	6,215,051	5,846,255	3,540,456

GRAND TOTAL: 15,601,762 tons
E—estimated

Compiled by PULP & PAPER

WORLD SHIPMENTS OF PAPER GRADE MARKET CHEMICAL PULP
(In thousands of short tons)

Country of Origin	*1956*		*1957*		*1958*		*1959*	
	Tons	*% of Total*	*Tons*	*% of Total*	*Tons*	*% of Total*	*Tons*	*% of Total*
U.S.A.	1,759	25.5	1,609	24.7	1,432	22.1	1,514	20.9
Canada	1,576	22.8	1,361	20.9	1,441	22.3	1,614	22.3
Sweden	2,125	30.8	2,036	31.2	2,043	31.6	2,423	33.4
Finland	1,146	16.6	1,190	18.2	1,232	19.1	1,385	19.1
Norway	295	4.3	327	5.0	317	4.9	315	4.3
Total	6,901	100.0%	6,523	100.0%	6,465	100.0%	7,251	100.0%
North America	3,335	48.3	2,970	45.6	2,873	44.4	3,188	43.2
Scandinavia	3,566	51.7	3,553	54.4	3,592	55.6	4,123	56.8

Source: Assn. of Pulp Consumers, Inc.

Finland and Norway Potentials

Finland ranks in third place, behind Sweden and Canada, as a pulp exporting nation, and growth trends are similar to those in Sweden, with recent surveys showing much more potential pulpwood resources than had been recorded in earlier surveys. It is believed that Finland will be able to add a million tons of capacity every year for a number of years if it wishes. In chemical pulps alone it exports around one and one half million tons. (More details on Finland are in separate report on that country.)

Possibilities of expansion are more restricted in Norway and its chemical pulp exports are only about one-third of a million tons—behind the U.S.A.—but it also is an important shipper of groundwood, relatively a much more important export product than in the other pulp producing nations.

Dissolving Pulp Trends

The dissolving pulp trade should be mentioned as this is becoming a major world trading commodity. U.S.A. exports 25% of the dissolving pulp it makes. Sweden is still the leader in exports of this pulp grade, too, about 400,000 tons a year, but U.S. shipments climbed to 285,700 tons. West Germany has gone ahead of Finland in producing dissolving pulp, and it is now being made in 14 countries. The writer was told in Russia of plans for a rayon tire cord pulp plant. South Africa, France and Turkey are also making dissolving pulp, now.

Views of European Market Men

With the Common Market and the Outer Free Trade area and possibility of their merging to some extent, certain pulp market executives on the European continent say they look for European consumption of paper to increase at even more than the present 4.5% per annum. While Scandinavia will continue to dominate as the supplier of pulp for Europe, these observers expect Europe will also need more pulp from America. Scandinavia's proportion of the market may decline while at the same time increasing in quantity. Meanwhile, with the greater integration in Sweden, these observers in Continental cities look for more imports of pulp from North America and from Russia, especially if the ratio of paper production increase rises above 4.5%.

Over the long term, some other factors may tend to slow down North American and Russian imports—Finland joining the Free Trade Area, the rapid progress of silviculture in Sweden, declining uses of European wood for mine props and for lumber (making more pulpwood available), the probability of British and Swiss capital becoming more available in Scandinavia within the Free Area, and higher productivity rates despite labor shortages.

Events in Scandinavia

Beginning this year, the curtailment of production of Scandinavian mills was abolished and the mills reportedly are working at full capacity. Buyers seem anxious to reserve for as long as the last open water for Scandinavian shipping in the forthcoming winter—up to February or March 1961.

As of around May 1, pulp mill stocks in Scandinavia were about 200,000 tons less than a year ago. Swedish bleached kraft is described as practically "sold out" for this year and the situation for bleached sulfite and unbleached kraft is described as approaching the same status. Strong sulfite is in good supply but it is expected all will be sold.

One of the new mills in Sweden is reportedly in the position of having sold all its 1960 production. Two more southern Swedish mills are coming into production in about two years. These are facts which indicate the happy position today in the world pulp market.

A Swedish labor agreement signed recently provided for a 3.5% wage increase in 1960 and again in 1961, with increase adjustments provided on top of that. However, this agreement was rejected by loggers and a new agreement, not yet made public as this was written, was expected to give 6% increases in 1960, and again in 1961. This, together with the new sales tax of 4.2%, is raising pulp production costs. One producer told the writer he figures costs will be increased Kr. 30 per metric ton this year.

Developments in Germany and France

A pulp marketer in West Germany sees a rising national income and standard of living favoring a continu-

GERMAN IMPORTS OF BLEACHED PULP—1959
(In air-dry metric tons)

From:	*Bleached Kraft Average Value*		*Semi-Bleached Kraft Average Value*		*Bleached Sulphite Average Value*	
	Tons	c.i.f. $	Tons	c.i.f. $	Tons	c.i.f. $
U.S.A.	20,440	145.04	15,691	131.45	3,042	161.52
Canada	9,253	144.46	5,811	129.69	—	—
Sweden	74,102	149.09	13,361	129.57	47,023	144.43
Finland	1,346	147.47	23,485	129.47	7,227	141.31
Norway	2,483	148.41	295	131.21	8,306	143.53
Austria	—	—	4,921	122.89	9,252	145.86
others	18,429	147.48	667	124.81	24,502	144.74
TOTAL	126,053	147.83	64,231	129.57	99,352	144.86

Source: Statistische Bundesamt, Wiesbaden.

RELATIVE IMPORTANCE OF NORTH AMERICA AND SCANDINAVIA AS FACTORS IN WORLD SUPPLY OF DISSOLVING WOODPULP ONLY
(As Percent of Combined Supply)

North America		*Scandinavia*	
1958	*1959*	*1958*	*1959*
60.9%	65.5%	39.1%	34.5%

115% INCREASE IN EARLY 1960:
WORLD DISTRIBUTION—U. S. PAPER GRADE PULP EXPORTS

	First Quarter		*Increase in 1960*	
	1960	*1959*	*Tons*	*Percent*
United Kingdom	48,250	19,466	28,784	147.8
Western Germany	24,981	6,572	18,409	280.3
Italy	13,257	5,108	8,149	159.5
France	9,199	3,276	5,923	180.7
Netherlands	8,345	2,437	5,908	242.4
Total Europe	110,807	40,332	70,475	174.8
Latin America	17,635	18,521	(d) 886	(d) 4.8
Canada	10,534	9,020	1,514	16.8
Rest of World	13,977	3,223	10,754	333.6
Total Exports	152,953	71,096	81,857	115.2

(d) Decrease in 1960

ing rise in paper consumption in that important pulp market. Paper pulps generally cannot be produced in Germany at prices competitive with those of suppliers. There is some changeover to dissolving pulps, more integration with paper and more bleaching in Germany. This observer expects the Scandinavian producers to take care of the greater share of Germany's increased needs. German paper mills want to buy pulps with high BLM and burst characteristics to blend with their own grades.

There are differences of opinion in the German and French industries as to whether the Free Trade Area and Common Market should be joined. But, nevertheless, even though they may oppose it, many foresee a joining of the two markets which would greatly benefit Scandinavian paper producers.

Watching Business Tempo in U.S.A.

A question on many lips in Europe, in the pulp trade, was whether there is any likelihood of an American business recession. This is an election year, and in the past there has been a slight dip in the U.S. economy post-election, but the pulp and paper industry leaders in U.S.A. refuse to believe this must be regarded as "a rule."

The president of the American Paper and Pulp Association was very emphatic recently in saying he and his associates saw no signs whatever of an American recession in 1960 or 1961. The paper industry is not actually "booming" in the U.S.A., as it is in Europe, but is steadily improving. Some leaders say they are happy there is no "boom" and this steady and less rapid growth is the best possible sign for the future.

Some of the pulp marketing firms in the main international business centers, with whom we have recently talked on both sides of the Atlantic, seem most disturbed over integration and the threat it holds of diminishing pulp available for export. But they all agree that there is no doubt whatever that paper production is growing and the increased demand for woodpulp is genuine.

British Viewpoint

In Britain there are questions as to whether U.S.A. and Canada are headed for a business plateau, or even a slight recession. Meanwhile, the pulp traders observe their own government is most concerned with avoiding inflation and see threats of all kinds of credit squeezes. In London the view is that anything which affects business may have more than ordinary impact on pulp as the overall demand and supply position is so finely balanced. A British view is that a paper price increase, to match the pulp increase, is going to be complicated by the cheaper imported paper under the Free Trade agreement beginning in July. On the other hand, the British agree there is plenty of room for more paper expansion in their own country as well as Europe, despite fears over Scandinavian paper imports.

ORIGIN OF U.S.A. MARKET WOODPULP—ALL GRADES

(In thousands of short tons)

	From U.S.A.	*From Canada*	*From Europe*	*Total Supply*	*As % of Total U.S.A.*	*Canada*	*Europe*
1937	761	512	1,683	2,956	26%	17%	57%
1947	1,374	1,082	794	3,250	42	33	25
1954	1,737	1,113	372	3,222	54	35	11
1955	2,073	1,262	349	3,684	56	34	10
1956	2,157	1,288	378	3,823	56	34	10
1957	1,957	1,120	266	3,344	59	33	8
1958	1,797	1,048	283	3,129	57	35	7
1959	1,937	1,144	455	3,536	54	32	12

U. S. Pulp Producers Assn., Inc.

MARKET WOODPULP FOR U.S.A.—TOTAL ALL GRADES

(In thousands of short tons)

	Production	*Imports*	*Exports*	*New Supply*
1937	1,084	2,195	323	2,956
1938	733	1,551	140	2,144
1939	1,007	1,820	140	2,687
1940	1,815	990	481	2,324
1941	1,988	850	329	2,509
1942	2,116	933	378	2,671
1943	1,574	971	301	2,244
1944	1,684	743	218	2,209
1945	1,590	1,395	135	2,850
1946	1,330	1,414	39	2,705
1947	1,504	1,876	130	3,250
1948	1,502	1,738	94	3,146
1949	1,321	1,301	122	2,500
1950	1,647	1,911	96	3,462
1951	1,907	1,832	202	3,537
1952	1,849	1,401	212	3,038
1953	1,784	1,578	162	3,200
1954	2,179	1,486	443	3,222
1955	2,707	1,612	635	3,684
1956	2,691	1,666	534	3,823
1957	2,586	1,386	628	3,344
1958	2,304	1,331	515	3,129
1959	2,542	1,599	652	3,489

U. S. Pulp Producers Assn., Inc.

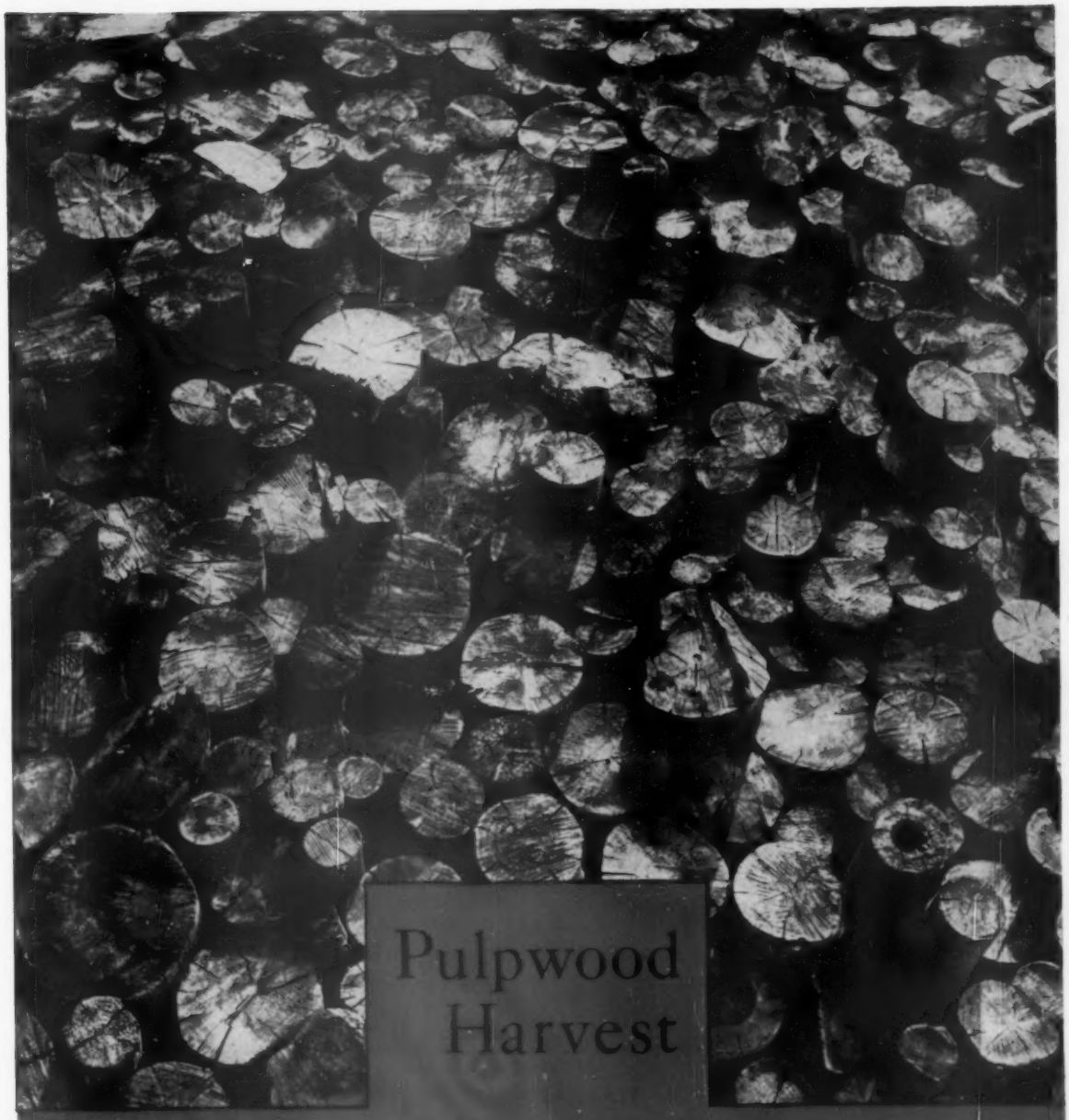
Market Pulp Forecasts

Some interesting figures on the market pulp situation:

The United Nations FAO Pulp Conference in Rome reported that the pulp requirements of the Common Market paper mills will rise by 2.3 million tons—42%—for the 1958-65 period. Common Market nations buy 80% of their pulp needs, about 65%, from Scandinavia.

Scandinavia's potential pulp supply by 1965 will be 5.7 million tons, or 68% above 1958. An undetermined portion of this would be converted to paper and paperboard by Scandinavian mills.

The average annual increase in U.S.A. woodpulp exports over the past ten years has been 50,000 tons. But only 14% of the woodpulp made in U.S.A. is made for market. About 30% of future increase pulp requirements in U.S. will be the result of furnish changes—more woodpulp in furnish—and remaining 70% because of expansion, says a U.S. Pulp Producers report.



This is the pulpwood harvest . . . cut, sized, and stacked, ready to be converted into high grade pulps for the paper, boxboard, and specialty paper industries. This is the harvest . . . the cash crop which Howard Smith researchers, tree scientists, technologists, and woods workers perpetuate through a continuing program of creative conservation . . . through selective cutting . . . through new and improved forest management techniques. This is the pulpwood harvest from which Howard Smith produces the finest pulps obtainable.

Howard Smith
PAPER MILLS LIMITED
PULP SALES DEPARTMENT
2300 Sun Life Building, Montreal 2, Canada
MAKERS OF CANADA'S FINEST PULPS AND PAPERS

Progressive paper companies rely on these quality pulps:

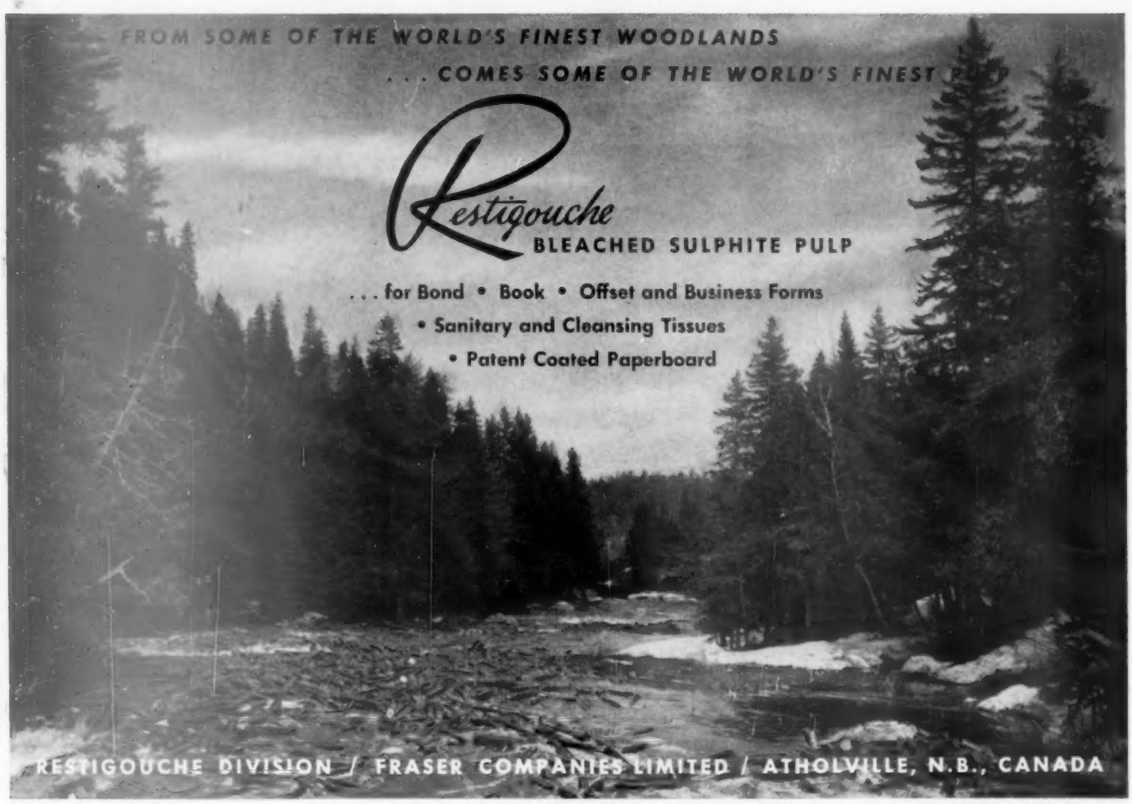
SEAGULL
Bleached Soda Pulp

STORMONT
Bleached Sulphite

DONNACONA
Unbleached Sulphite

WINDSOR
Unbleached Kraft

THIS AD...


FROM SOME OF THE WORLD'S FINEST WOODLANDS
. . . COMES SOME OF THE WORLD'S FINEST PULP
Restigouche
BLEACHED SULPHITE PULP
. . . for Bond • Book • Offset and Business Forms
• Sanitary and Cleansing Tissues
• Patent Coated Paperboard
RESTIGOUCHE DIVISION / FRASER COMPANIES LIMITED / ATHOLVILLE, N.B., CANADA

depicts one segment of the pulp process—the drive—and briefly describes one pulp. But it is just one of many grades of Market Woodpulps that are quality products of Fraser Companies, Limited.

When buying your pulp, remember these quality grade names:

— **RESTIGOUCHE STANDARD BLEACHED SULPHITE**
— **RESTIGOUCHE RB BLEACHED SULPHITE**
— **RESTIGOUCHE UNBLEACHED SULPHITE**
— **FRASER UNBLEACHED KRAFT**
— **NEWCASTLE UNBLEACHED KRAFT**

Samples and prices on any of the above pulps are available from Fraser Companies, Limited, 1010 St. Catherine St., W., Montreal, Canada

FRASER COMPANIES, LIMITED / MONTREAL, CANADA

PULP & PAPER

WORLD MARKET PULP DIRECTORY

Compiled by PULP & PAPER Copyright, 1960

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Worldwide Directory by Grades

Information on addresses, trade names, etc., may be found in the listing by companies which immediately follows this section.

Dissolving and Special
Alpha

Austria
Kellner-Partington Paper Pulp Co., Ltd.
Lenzinger Zellulose- und Papierfabrik

Canada
Alliance Paper Mills, Ltd.
Canadian International Paper Co.
Columbia Cellulose Co., Ltd.
Fraser Companies Ltd.
Rayonier Canada Ltd.
St. Raymond Paper, Ltd.

Finland
Enquist, J. W., Oy
Oy Kaukas Ab
Rauma Repola Oy
Rosenlew, W. and Co., Ab

France
Sica S.A.

West Germany
Zellstofffabrik Waldhof

Japan
Kokoku Rayon and Pulp Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Sanyo Pulp Co., Ltd.
Tohoku Pulp Co., Ltd.

Norway
Borregaard, A/S
Mathiesen-Eidsvold Vaerk
Saugbrugsforeningen

Sweden
Bengtsfors Sulfitaktiebolag
Billerud A/B
Edsvalla Bruk, A/B
Forss A/B
Korsnäs A/B
Mo & Domsjö A/B
Molnback-Trysil, A/B
Ströms Bruks A/B
Svenska Cellulosa A/B
Uddeholms A/B
Utansjö Cellulosa A/B
Wifstavarfs A/B
Wikmanshytte Bruks A/B

United States
Alaska Lumber & Pulp Co.
Brown Company
Buckeye Cellulose Corp.
International Paper Co.
Ketchikan Pulp Co.
Rayonier, Inc.
Scott Paper Co., West Coast Division
Weyerhaeuser Co., Pulp and Paperboard Div.

Paper Grades
SULFITE, BLEACHED

Austria
Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Hamburger, W.
Kellner-Partington Paper Pulp Co. Ltd.
Leykam-Josefsthal AG
Neusiedler AG
Pölser Zellulose- und Papierfabrik AG
Steyrermühl AG
St. Michael AG

Canada
Abitibi Power & Paper Co., Ltd.
Alliance Paper Mills, Ltd.
Canadian International Paper Co.
Columbia Cellulose Co. Ltd.
Fraser Companies, Ltd.
Gaspesia Sulphite Co., Ltd.
Howard Smith Paper Mills Ltd.
Irving Pulp & Paper Ltd.
North Western Pulp & Power, Ltd.
Rayonier Canada Ltd.

Finland
Enquist, J. W., Oy
Haarlan Selluloosayhtio
Kajaani Oy
Oy Kaukas Ab
Kymmene, Ab
Metsaliiton Selluloosa Oy
Rosenlew, W. and Co., Ab
Serlachius, G. A., Oy
Veitsiluoto Oy (V.L.)
Yhtyneet Paperitehtaat Oy

West Germany
Aschaffenburger Zellstoffwerke AG
Zellstofffabrik Waldhof

Japan
Kokoku Rayon and Pulp Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Sanyo Pulp Co., Ltd.
Tohoku Pulp Co., Ltd.

Norway
Borregaard, A/S
Greaker Cellulosefabrik A/S

Our
Mills
By the
PENOBSCOT RIVER
OLD TOWN, MAINE

PENOBSCOT PULPS

Soda · Softwood Sulphite · Hardwood Kraft

Chlorine Dioxide Bleached

PENOBSCOT CHEMICAL FIBRE COMPANY

Market Wood Pulps Since 1882

211 CONGRESS STREET
BOSTON 10, MASSACHUSETTS

Telephone: LIBERTY 2-3870

Krogstad Cellulosefabrik A/S
Mathiesen-Eidsvold Vaerk
Mjöndalen Cellulosefabrik A/S
Tofte Cellulosefabrik A/S
Toten Cellulosefabrik A/S
Vestfos Cellulosefabrik A/S

Portugal
Caima Pulp Co., Ltda

Sweden
Bengtsfors Sulfitakiebolag
Bergvik och Ala A/B
Billerud A/B
Edsvalla Bruk A/B
Forss A/B
Hissmofors A/B
Hylte Bruks A/B
Iggesunds Bruk A/B
Klippans Finpappersbruk A/B
Korsnäs A/B
Marma-Långrörs A/B
Mo & Domsjö A/B
Molnbacka-Trysil, A/B
Munkedals A/B
Stora Kopparbergs Bergslags A/B
Ströms Bruks A/B
Svenska Cellulosa, A/B
Uddeholms A/B
Wifstavarfs A/B

Switzerland
Cellulosefabrik Attisholz AG
Papierfabrik Perlen

United States
Alaska Lumber & Pulp Co.
Crown Zellerbach Corp.
Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
International Paper Corp.
Ketchikan Pulp Co.
Penobscot Chemical Fibre Co.
Puget Sound Pulp & Timber Co.
Rayonier Inc.
St. Regis Paper Co.
Scott Paper Co., West Coast Division
Weyerhaeuser Co., Pulp and Paperboard Div.

Yugoslavia
Fabrika Celuloze (Prijedor)
Fabrika Celuloze I Papira "Duro Salaj"
Fabrika, Sulfitne Celuloze Medvode
Zagrebačka Tvornica Papira

SULFITE, UNBLEACHED

Austria
Ahlström, A., Oy
Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Hamburger, W.
Leykam-Josefsthal AG
Nettingsdorfer Papierfabrik AG
Neusiedler AG
Pölser Zellulose-und Papierfabrik AG
Steyrermühl AG
St. Michael AG

Canada
Anglo-Canadian Pulp and Paper Mills, Ltd.
Anglo-Newfoundland Development Co., Ltd.
Bowaters Mersey Paper Co., Ltd.
Bowater's Newfoundland Pulp & Paper Mills, Ltd.
Canadian International Paper Co.
Donnacona Paper Co., Ltd.
Fraser Companies, Ltd.
Gaspesia Sulphite Co., Ltd.
Great Lakes Paper Co., Ltd.
James Maclaren Co., Ltd.
Ontario Paper Co., Ltd.
Quebec North Shore Paper Co.
St. Lawrence Corp., Ltd.
St. Raymond Paper, Ltd.
Spruce Falls Power and Paper Co., Ltd.

Finland
Eklöf, Aug., Ab
Enso-Gutzeit Oy
Jakobstads Cellulosa Ab
Kemi, Oy
Kymmene, Ab
Nokia Oy
Serlachius, G. A., Oy
Toppila, Oy
Veitsiluoto Oy (V. L.)
Yhtyneet Paperitehtaat Oy

West Germany
Aschaffenburger Zellstoffwerke AG
Zellstofffabrik Waldhof

Japan
Kokusaku Pulp Co. Ltd.
Sanyo Pulp Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Tohoku Pulp Co., Ltd.

Norway
Gulskogen Cellulosefabrik A/S
Katfos Fabriker, A/S

Sweden
Bergvik och Ala A/B
Billerud A/B
Fiskeby Fabriks A/B
Hellefors Bruks A/B
Katrinefors A/B
Mackmyra Sulfit A/B
Marma-Långrörs A/B
Oskarström Sulphite Mills A/B
Stjernfors-Ställdalen A/B
Storviks Sulfit A/B
Svano A/B
Svenska Cellulosa, A/B
Utansjö Cellulosa A/B
Wifstavarfs A/B

Switzerland
Cellulosefabrik Attisholz AG
Papierfabrik Perlen

United States
Crown Zellerbach Corp.
Spaulding Pulp and Paper Co.

Yugoslavia
Fabrika Celuloze (Prijedor)
Fabrika Celuloze I Papira "Duro Salaj"
Fabrika, Sulfitne Celuloze Medvode
Zagrebačka Tvornica Papira

SULFATE, BLEACHED

Canada
British Columbia Forest Products Ltd.
Canadian International Paper Co.
Celgar Ltd.—early 1961
Dryden Paper Co., Ltd.
The KVP Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
Marathon of Canada, Ltd., Div of American Can Co.
North Western Pulp & Power, Ltd.
Thurso Pulp & Paper Co.

Finland
Enso-Gutzeit Oy

France
Cellulose d'Aquitaine
La Cellulose du Rhône

Japan
Hyogo Pulp Industry Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nagoya Pulp Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Takahagi Pulp Co., Ltd.
Tsurusaki Pulp Co., Ltd.

Portugal
Companhia Portuguesa de Celulose

Sweden
Forss A/B
Iggesunds Bruk, A/B
Kopparfors A/B
Korsnäs A/B
Mo & Domsjö A/B
Munksjö A/B
Statens Skogsindustrier A/B
Stora Kopparbergs Bergslags A/B
Svenska Cellulosa A/B
Uddeholms A/B

United States
Bowaters Carolina Corp.
Brunswick Pulp & Paper Co.
Buckeye Cellulose Corp.
Champion Paper & Fibre Co.
Coosa River Newsprint Co.
Crown Zellerbach Corp.
East Texas Pulp and Paper Co.
Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
Gulf States Paper Corp.
International Paper Co.
Marathon Southern Corp.
Oxford Paper Co.
Penobscot Chemical Fibre Co.
Potlatch Forests, Inc.
Rayonier Inc.
Riegel Paper Corp., Carolina Div.
St. Regis Paper Co.
Scott Paper Co., Hollingsworth & Whitney Div.
West Virginia Pulp and Paper Co.
Weyerhaeuser Co., Pulp and Paperboard Div.

Yugoslavia
Tvornica Sulfatne Celuloze I Natron Papira

SULFATE, SEMI-BLEACHED

Canada
British Columbia Forest Products Ltd.
Canadian Forest Products Ltd.
MacMillan, Bloedel & Powell River Ltd.

Finland
Oulu Oy
Sunila Oy

Portugal
Companhia Portuguesa de Celulose

Sweden
Korsnäs A/B
Marma-Långrörs A/B
Skogsagarnas Cellulosa A/B

United States
Bowaters Carolina Corp.
Bowaters Southern Paper Corp.
Champion Paper & Fibre Co.
Halifax Paper Co., Inc.
Scott Paper Co., Hollingsworth & Whitney Div.

SULFATE, UNBLEACHED

Austria
Frantschach Zellulose- und Papierfabrik AG
Nettingsdorfer Papierfabrik AG

Canada
Canada Paper Co.
Canadian Forest Products Ltd.
Canadian International Paper Co.
Consolidated Paper Corp., Ltd.
Dryden Paper Co., Ltd.
Fraser Companies, Ltd.
The KVP Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
St. Lawrence Corp., Ltd.

Finland
Enso-Gutzeit Oy
Joutseno-Pulp Oy
Kemi, Oy
Lohja-Kotka, Oy
Oulu Oy
Sunila Oy

Japan
Hokuetsu Paper Mills Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nagoya Pulp Co., Ltd.
Taiko Paper Mfg. Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Toyo Pulp Co., Ltd.
Tsurusaki Pulp Co., Ltd.

Norway
A/S And. H. Kiaer & Co., Ltd.

Portugal
Companhia Portuguesa de Celulose

Sweden
Bäckhammars Bruk A/B
Bergvik och Ala A/B
Dynäs A/B
Eds Cellulosafabriks A/B
Fiskeby Fabriks A/B
Forss A/B
Iggesunds Bruk, A/B
Korsnäs A/B
Marma-Långrörs A/B
Mo & Domsjö, A/B
Sandvikens Cellulose A/B
Skogsagarnas Cellulosa A/B
Statens Skogindustrier, A/B
Svenska Cellulosa A/B
Wifstavarfs A/B

United States
Bowaters Carolina Corp.
Chesapeake Corp. of Virginia
Container Corp. of America
Crown Zellerbach Corp.
Georgia-Pacific Paper Co.
Halifax Paper Co., Inc.
International Paper Co.
Owens-Illinois Mill Div.
Oxford Paper Co.
St. Mary's Kraft Corp.
St. Regis Paper Co.
West Virginia Pulp and Paper Co.

Yugoslavia
Tvornica Sulfatne Celuloze I Natron Papira

SODA, BLEACHED

Canada
Howard Smith Paper Mills Ltd.

United States
The Mead Corp.
New York and Pennsylvania Co.
Penobscot Chemical Fibre Co.

SEMI-CHEMICAL

Austria
Hamburger, W.

Canada
Richmond Pulp & Paper Co. of Canada Ltd.

West Germany
Aschaffenburger Zellstoffwerke AG

Japan
Sanyo Pulp Co., Ltd.
Taio Paper Mfg. Co., Ltd.

Sweden
Katrinefors A/B

Switzerland
Dozière S. A., Fabrique de cellulose

GROUNDWOOD

Austria
Holzstoff-Verkaufsstelle GmbH

Canada
Abitibi Power & Paper Co., Ltd.
Bathurst Power & Paper Co., Ltd.
John Breakey, Ltd.
Canada Paper Co.
Gulf Pulp & Paper Co.
Halifax Power & Pulp Co., Ltd.
Lotbinière Pulp & Paper Co., Ltd.
James Maclaren Co., Ltd.
Minas Basin Pulp & Power Co., Ltd.
Mohawk Corp., Ltd.
Provincial Paper Ltd.
Quebec North Shore Paper Co.
Richmond Pulp & Paper Co. of Canada, Ltd.
St. George Pulp & Paper Co., Ltd.
St. Lawrence Corp., Ltd.
St. Raymond Paper, Ltd.
Soucy, F. F., Inc.
Thorold Pulp Co., Ltd.

Finland
Ahlström, A., Oy
Myllykosken Paperitehdas Oy
Stockfors Ab
Svarta Bruk, Oy, Ab
Toppila Oy

Japan
Hokuetsu Paper Mills Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Tohoku Pulp Co., Ltd.

Norway
A/S Egelands Verk
Fostvedt A/S
Lövenskiold-Fossum
A/S Namdalens Traesliperi
A/S Skrankefos Traesliperi
A/S Songe Traesliperi
Tinfos Papirfabrik
Viul Tresliperi, A/S

Portugal
Companhia Portuguesa de Celulose

Sweden
Bure A/B
Forsse Woodpulp Mill
Hogfors Trasliperi, A/B
Iggesunds Bruk, A/B
Marma-Långrörs A/B
Rockhammars Bruks A/B
Rottneros Bruk, A/B
Scharins-Soner A/B
Slottsbrons Träförädlings A/B
Svenska Cellulosa A/B
Uddeholms A/B

Switzerland
Fabrique de Pâtes de Bois de la Doux

United States
American Wood Board Co.
Arizona Pulp & Paper Co.
Scott Paper Co., Hollingsworth & Whitney Div.
Sealright-Oswego Falls Corp.
Tomahawk Pulp Co.
Washington Pulp and Timber Co.

ESPARTO, BLEACHED

France
L'Alfa S. A.
La Cellulose du Rhône

STRAW, BLEACHED

Italy
Cartiere Burgo S.p.A.

The Netherlands
Coop. Stroocartonfabriek "DE EENDRACHT"
N. V. Stroostoffabriek "PHOENIX"
N. V. Maatschappij tot Stroveredeling "SOVE"

SCREENINGS

Canada
Abitibi Power & Paper Co., Ltd.
Canadian International Paper Co.
Gaspesia Sulphite Co., Ltd.
Great Lakes Paper Co., Ltd.
Gulf Pulp & Paper Co.
Provincial Paper Ltd.
St. Raymond Paper, Ltd.

Finland
Kajaani Oy
Veitsiluoto Oy (V. L.)

Sweden
Svenska Cellulosa A/B

United States
Brown Company

PUGET PULP

Puget Pulp's centri-cleaners

start with PUGET PULP...
...the uniformly strong, clean, white
chlorine dioxide bleached
softwood sulphite

PUGET SOUND PULP & TIMBER CO.
BELLINGHAM • WASHINGTON

World Producers of Market Pulp

Compiled especially by PULP & PAPER magazine. Listings following company names and addresses give type of pulp and brand names. All grades are softwood unless otherwise specified.

AUSTRIA

Arland Papier- und Zellstoff-Fabriken AG
Graz-Andritz, Styria
Mill at: Rechberg, Carynthia
Sulfite, bleached and unbleached
Soft and hardwood high yield pulps

Brigl & Bergmeister AG
Niklasdorf/Mur, Styria
Sulfite, bleached and unbleached

Frantschach Zellstoff- und Papierfabrik AG
Vienna 9, Berggasse 7
Mill at: Frantschach, Carynthia
Sulfate, unbleached

Hamburger, W.
Vienna 1, Mahlerstrasse 7
Mill at: Pitten, Lower Austria
Sulfite, bleached and unbleached
Semi-chemical

Holzstoff-Verkaufsstelle GmbH
Vienna 6, Gumpendorferstasse 6
Incorporates 25 groundwood mills
Groundwood

Kellner-Partington Paper Co. Ltd.
Hallein bei Salzburg
Mills at: Hallein & Villach
Sulfite, bleached
Dissolving and related grades
Special grades
Brands: V.S.; Super V.S.;
Super A-1; A-1

Lenzinger Zellulose- und Papierfabrik AG
Lenzing/Upper Austria
Sulfite, bleached
Dissolving

Leykam-Josefsthal AG
Vienna 1, Parkring 2
Mill at: Gratkorn, Styria
Sulfite, bleached and unbleached

Nettingsdorfer Papierfabrik AG
Nettingsdorf, Upper Austria
Sulfite, unbleached
Sulfate, unbleached

Neusiedler AG
Vienna 1, Schottenring 21
Mills at:
Kematen
Weissenbach
Sulfite, bleached and unbleached

Pölser Zellulose- und Papierfabrik AG
Pöls bei Judenburg
Sulfite, unbleached and bleached

Steyrermühl AG
Vienna 1, Karntnerring 4
Mill at: Steyrermühl, Upper Austria
Sulfite, bleached and unbleached

St. Michael AG
Vienna 1, Singerstrasse 8
Mill at: Hinterberg nr. Leoben, Styria
Sulfite, bleached and unbleached

CANADA

Abitibi Power & Paper Co., Ltd.
408 University Ave., Toronto 2, Ont.
Mills at:
Pine Falls, Man.
Fort William, Ont.
Port Arthur, Ont.
Sault Ste. Marie, Ont.
Iroquois Falls, Ont.
Beaupre, P.Q.
Smooth Rock Falls, Ont.
Sturgeon Falls, Ont.
Thorold, Ont.
Georgetown, Ont.
Sulfite, bleached
Standard grades
Sulfite screenings
Groundwood
Brand: Abitibi

Alliance Paper Mills, Ltd.
Merritton, Ont.
Sulfite, bleached
Special grades
Glassine
Tissue
Brand: Alliance

Anglo-Canadian Pulp and Paper Mills, Ltd.
10-16 Blvd. des Capucins, Quebec
Sulfite, unbleached
Brand: Anglocan

Anglo-Newfoundland Development Co. Ltd.
Grand Falls, Newfoundland
Sulfite, unbleached
Brand: A.N.D.

Bathurst Power & Paper Co., Ltd.
Head office:
Bathurst, N.B.
Exec. offices:
760 Sun Life Bldg., Montreal 2, Que.
Sales organization: Bathurst Paper Sales Ltd. (sales company for all products of the Mills Division)
760 Sun Life Bldg., Montreal 2, Que.
1035 Hodge St., St. Laurent, Que.
1000 Gerard St., E., Toronto, Ont.
Mill at: Bathurst, N.B.
Groundwood
Brand: Bathurst

Bowaters Mersey Paper Co., Ltd.
Liverpool, N.S.
Sulfite, unbleached
Standard grades

Bowater's Newfoundland Pulp & Paper Mills, Ltd.
Corner Brook, Newfoundland
Sulfite, unbleached
Standard grades

John Breakey, Ltd.
Breakeyville, Que.
Groundwood

British Columbia Forest Products, Ltd.
Crofton, B.C.
Sulfate, bleached and semi-bleached
Brand: Crofton Kraft

Canada Paper Co.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Windsor Mills, Que.
Groundwood
Sulfate, unbleached
Premium special grade
Brand: Windsor

Canadian Forest Products Ltd.
Howe Sound Pulp Division
Executive office:
999 W. Pender St., Vancouver 1, B.C.
Mill at: Port Mellon, B.C.
Sulfate, semi-bleached and unbleached

Canadian International Paper Co.
Sun Life Bldg., Montreal 2, Que.
Mills at:
Hawkesbury, Ont.
Gatineau, Que.
LaTuque, Que.
Temiskaming, Que.
Sulfite, bleached
Dissolving and paper grades
Sulfite, unbleached
Standard grades
Sulfite screenings
Sulfate
High Alpha, bleached and unbleached for specialty papers
Brands: Novocell; Tenacell; Filmcell; Acetacell; Plasticell; Photopulp

Celgar Ltd. (Subsidiary of Columbia Cellulose Co.)
1030 West Georgia St., Vancouver 5, B.C.
Mill under construction at Castlegar, B.C.
Sulfate, bleached—early 1961
Standard grades

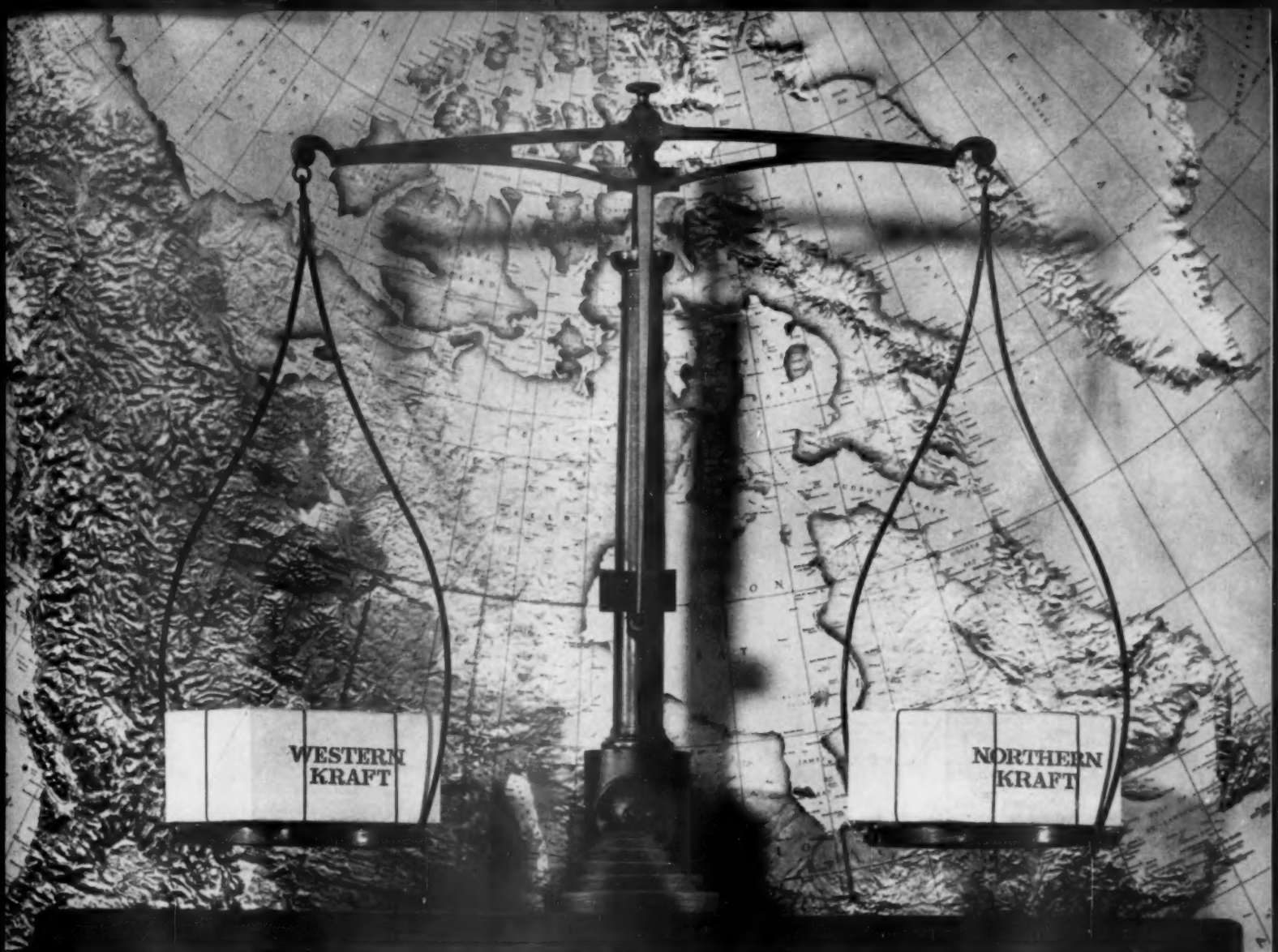
Columbia Cellulose Co. Ltd.
1030 West Georgia St., Vancouver 5, B.C.
Mill at: Prince Rupert, B.C.
Sulfite, bleached
Dissolving and special grades

Consolidated Paper Corp., Ltd.
Sales office:
Consolidated Paper Sales, Ltd.
Sun Life Bldg., Montreal, Que.
Mills at:
Port Alfred, Que.
Grand Mere, Que.
Cap de la Madeleine, Que.
Shawinigan Falls, Que.
Sulfate, unbleached

Donnacona Paper Co., Ltd.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Donnacona, Que.
Sulfite, unbleached
Standard grades
Brand: Donnacona

Dryden Paper Co., Ltd.
Dryden, Ont.
Sulfate, bleached and unbleached
Brand: Dryden

Fraser Companies, Ltd.
Sales office:
1010 St. Catherine St. W., Montreal 2, Que.
Mills at:
Edmundston, N.B.
Newcastle, N.B.
Atholville, N.B.
General offices: Edmundston, N.B.
Sulfite, bleached
Paper and dissolving grades
Sulfite, unbleached
Standard grades
Sulfate, unbleached
Standard grades
Brands: Resticose; Restophane



CELGAR KRAFT HAS THE BALANCE

The outstanding feature of Celgar Kraft pulp will be its balance of properties.

Because of the species blend in the Southern Interior of British Columbia, the Interior pulp resembles Northern Kraft pulps in many ways. It combines the outstanding tearing resistance of the West Coast fibres with the high bursting strength of Northern krafts over a wide range of freeness and in a variety of stock preparation equipment.

With this blend of qualities, Celgar Kraft will be a premium pulp in almost any field of use.

Scheduled to go on stream early in 1961, the 500-ton Celgar mill is located on the Columbia River at Castlegar, just north of the Washington border.

V4427-1

COLUMBIA PULP SALES LIMITED has been formed to distribute Celgar Kraft pulps and Columbia Cellulose sulphite pulps. Offices are located at:
1030 West Georgia St., Vancouver 5, B.C.
1600 Dorchester St. West, Montreal 25, P.Q.

Celgar Kraft

Gaspesia Sulphite Co., Ltd.
Chandler, Que.
Sulfite, bleached
Standard grades
Sulfite, unbleached
Glassine
Brand: Wonderwhite

The Great Lakes Paper Co., Ltd.
P.O. Box 430, Fort William, Ont.
Sulfite, unbleached
Standard grades
Sulfite, unbleached glassine
Sulfite screenings
Brand: Great Lakes

Gulf Pulp & Paper Co.
65 St. Anne St., Quebec, Que.
Mill at: Clarke City, Que.
Groundwood—pressed wet
Special unbleached
Standard unbleached
Screenings
Brand: Gulf

Halifax Power & Pulp Co. Ltd.
Sheet Harbour, Nova Scotia
Groundwood
Flash dried standard unbleached

Howard Smith Paper Mills Ltd.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Cornwall, Ont.
Sulfite, bleached
Standard grades
Soda
Bleached
Standard unbleached
Brands: Stormont; Seagull

Irving Pulp & Paper Ltd.
P.O. Box 280, Lancaster, N. B.
Sulfite, bleached
Prime grades
Brand: Irving

The KVP Co., Ltd.
200 Bay St., Toronto, Ont.
Mill at: Espanola, Ont.
Sulfate, bleached and unbleached

Lotbinière Pulp & Paper Co., Ltd.
Danville, Que.
Mill at: Nicolet Falls, Que.
Groundwood—unbleached (moist)
Standard grades—tissue and board
Brand: Lotbiniere

The James Maclaren Co., Ltd.
Buckingham, Que.
Sulfite, unbleached
Standard grades
Groundwood

MacMillan, Bloedel & Powell River Ltd.
1199 West Pender St., Vancouver, B.C.
Mill at: Harmac, B.C.
Sulfate, bleached, semi-bleached
Brand: Harmac
Mill at: Port Alberni, B.C.
Sulfate, semi-bleached, unbleached
Brand: Alberni

Marathon Corp. of Canada Ltd., Div. of American Can Co.
Sales office:
Menasha, Wis.
Mill at: Marathon, Ont.
Sulfate, bleached
Brands: Marathon Bleached Softwood Kraft; Marathon Bleached Hardwood Kraft

Minas Basin Pulp & Power Co., Ltd.
Hantsport, N.S.
Groundwood
Special bleached
Standard unbleached
Brand: Minas Basin

Mohawk Corp., Ltd.
P.O. Box 155, Rivière du Loup, Que.
Mill at: Rivière du Loup
Groundwood
Standard unbleached

North Western Pulp & Power Ltd. (Jointly owned by St. Regis Paper Co. and North Canadian Oils Ltd.)
Hinton, Alberta
Sales office:
St. Regis Paper Co., New York, N.Y.
Sulfate, bleached
Brand: Alberta Hi-Brite

Ontario Paper Co., Ltd.
Thorold, Ontario
Sulfite, unbleached
Brand: Opco

Provincial Paper Ltd. (Subsidiary of Abitibi Power & Paper Co., Ltd.)
388 University Ave., Toronto, Ont.
Mills at:
Georgetown, Ont.
Port Arthur, Ont.
Thorold, Ont.
Groundwood
Standard unbleached
Sulfite Screenings
Brand: Provincial

Quebec North Shore Paper Co.
Head Office:
680 Sherbrooke St. W., Montreal, Que.
Sales Office:
Ontario Paper Co., Ltd., Thorold, Ont.
Mill at: Baie Comeau, Que.
Sulfite, unbleached
Special grades
Standard grades
Groundwood
Standard unbleached

Rayonier Canada Ltd.
Mills at:
Port Alice, B.C.
Woodfibre, B.C.
Sulfite, bleached
Paper and dissolving grades

Richmond Pulp & Paper Co. of Canada, Ltd. (Part of the Kruger Organization)
Bromptonville, Que.
Semi-chemical
Groundwood
Standard unbleached
Brand: Richmond

St. George Pulp & Paper Co., Ltd.
Mill at: St. George, N.B.
P.O. Box 218, St. George, N.B.
Groundwood
Bleached
Unbleached
Brand: Fibrewhite

St. Lawrence Corp., Ltd.
Sales office:
St. Lawrence Sales Co., Ltd.
Sun Life Bldg., Montreal, Que.
Mills at:
Dolbeau, Que.
East Angus, Que.
Nipigon, Ont.
Red Rock, Ont.
Three Rivers, Que.
Sulfite, unbleached
Standard grades
Bleachable grades
Sulfate, unbleached
Standard grades
Groundwood
Standard unbleached

St. Raymond Paper, Ltd.
Sales office:
St. Raymond Sales Ltd.
2100 Drummond St., Montreal 25, Que.
Mills at:
Desbiens, Que.
St. Raymond, Que.
Sulfite, unbleached
Special grades
Standard grades
Groundwood
Standard unbleached
Sulfite screenings
Newsprint
Brand: Metabetchouan

Soucy, Inc., F. F.
Chemin du Lac, Co. Temiscouata, Que.
Groundwood
Standard unbleached
Brand: Soucy; Snow Flake

Spruce Falls Power and Paper Co., Ltd.
2 Carlton St., Toronto 2, Ont.
Mill at: Kapuskasing, Ont.
Sulfite, unbleached

Thorold Pulp Co., Ltd.
Front Street, Thorold, Ont.
Groundwood
Standard unbleached

Thurso Pulp & Paper Co.
Mill at: Thurso, Que.
Sulfate, bleached
Soft and hardwood
Brand: Thurso

FINLAND

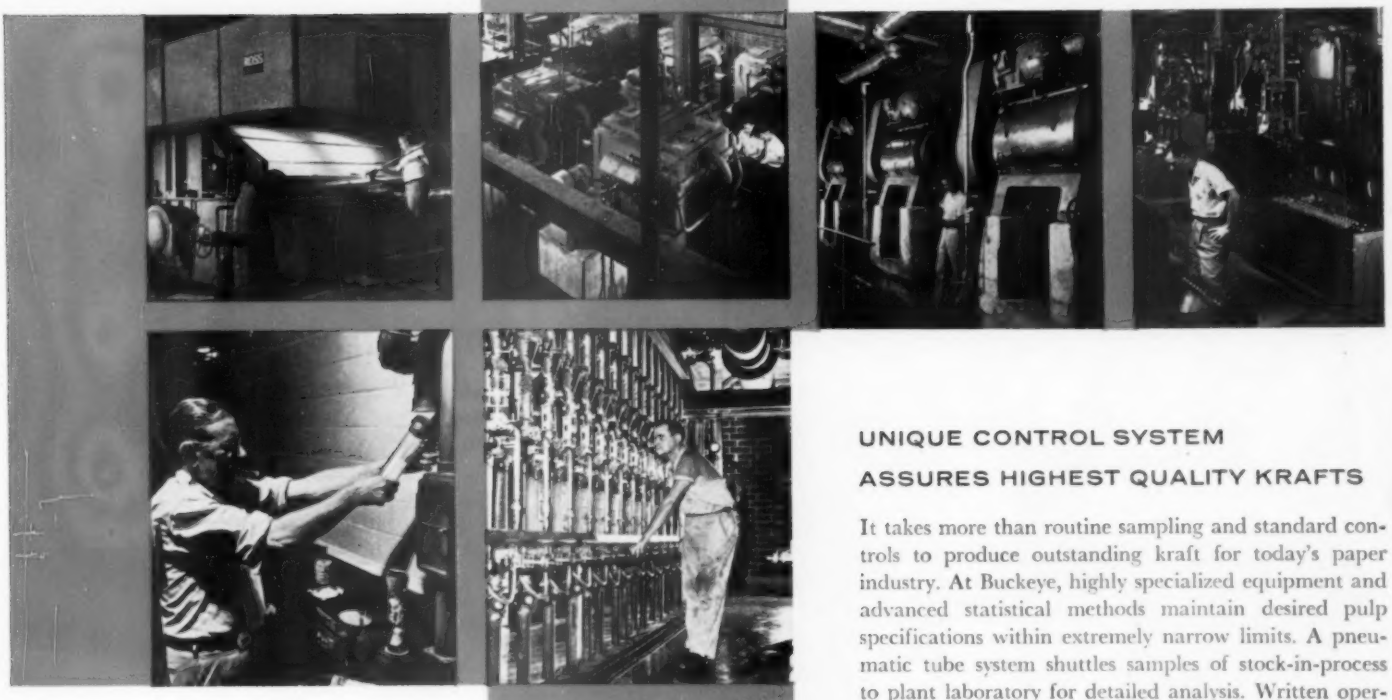
Ahlström, A., Oy
Mill at: Warkaus
Sulfite, unbleached
Special grades
Brands: Ahlstrom (Blue) Strong; Ahlstrom BL Bleachable; Ahlstrom EB Easy Bleaching
Mill at: Karhula
Wet groundwood
Brands: Karhula "SN"; "S" and "SB"

Eklöf, Aug., Ab
Borga
Sulfite, unbleached
Standard grades
Brands: Eklof Extra strong (Green); Eklof strong (Blue); Eklof Easy bleaching (Red)

Enquist, J.W. Oy, (Sphinx)
Lielahti
Sulfite, bleached
Dissolving and special grades
Standard grades
Brands: Sphinx (Red) for Rayon; Sphinx (Red) Extra Soft; Sphinx (Black) Soft; Sphinx (Blue) Strong; also semi-prime, second and third qualities and dry and wet screenings.

Enso-Gutzeit Oy
Mills at:
Kaukopaa
Kotka
Tainionkoski
Sulfate, unbleached
Special grades
Standard grades
Brands: Seal BL (Black) Bleachable; Seal L & S (Black) Light & Strong; Seal (Blue)

Everything's under control at Buckeye



UNIQUE CONTROL SYSTEM ASSURES HIGHEST QUALITY KRAFTS

It takes more than routine sampling and standard controls to produce outstanding kraft for today's paper industry. At Buckeye, highly specialized equipment and advanced statistical methods maintain desired pulp specifications within extremely narrow limits. A pneumatic tube system shuttles samples of stock-in-process to plant laboratory for detailed analysis. Written operating instructions cover every pulp, every stage, every process condition. Nothing is left to chance.

For highest quality krafts today, tomorrow, and in the years to come, contact Buckeye . . . the market pulp producer with everything under control.

BUCKEYE CELLULOSE CORPORATION
Memphis 8, Tennessee
Wood pulp plant at Foley, Florida
Cotton linters plant at Memphis

BUCKEYE PULP

Bleached Kraft

Kraft; Seal (Green) Kraft, Extra Strong; Gutzeit (Blue) Kraft; Gutzeit (Green) Kraft, Extra Strong; also second qualities
Sulfate, bleached
Brand: Enso (Blue) Kraft; also second qualities
Sulfite, unbleached
Special grades
Brands: Torna (Red) Easy Bleaching; Torna (Black) for Greaseproof and Glassine; Torna (Blue) Strong; Torna (Green) Extra Strong

Haarlan Selluloosayhtio
Lievestuore
Sulfite, bleached
Standard grades—hardwood
Brands: Haarla Aspen (hardwood); Haarla Birch (hardwood)

Jakobstads Cellulosa Ab
Jakobstad
Sulfite, unbleached
Special grades
Standard grades
Brands: Jakobstad (Green) Extra Strong; Jakobstad (Green) G Glassine; Jakobstad (Blue) Strong; also semi-prime, second quality, dry screenings

Joutseno-Pulp Oy
Pulp
Sulfate, unbleached
Special grades
Standard grades
Brands: JsssP (Green) Extra strong; JsssP (Blue) Strong; also second quality wet screenings

Kajaani Oy
Kajaani
Sulfite, bleached
Special grades
Standard grades
Brands: Kajaani CD Green, Kajaani CD Black, Kajaani CD Red, Kajaani Blue, Kajaani Red; also semi-prime qualities and dry screenings

Oy Kaukas Ab
Kaukas
Sulfite, bleached
Dissolving and special grades
Standard grades
Brands: KF One Crown; Two Crown; Three Crown; Four Crown for viscose; KF One A, Two A for Acetate; KF (Blue) Strong; KF (Black) Soft; KF (Red) Extra Soft; also second and third qualities

Kemi Oy
Kemi
Sulfite, unbleached
Special grades
Standard grades
Brands: Kemi (Green) Extra Strong; Kemi (Blue) Strong; also semi-prime, second and third qualities and dry screenings
Sulfate, unbleached
Special grades
Standard grades
Brands: Kemi OK Strong; Kemi Con Condenser; also second and third qualities

Kymmene Aktiebolag
Kuusankoski
Sulfite, bleached
Brands: Kuusankoski Extra Strong Bond Special (Green); Kuusankoski Extra Strong Bond (Green)

Lohja-Kotka Oy
Lohja
Sulfate, unbleached
Standard grades
Brand: Lohja (Blue) Strong

Metsaliiton Selluloosa Oy
Aanekoski
Sulfite, bleached
Standard grades—soft and hardwood
Special grades
Brands: Aanekoski (Green) Extra Strong; Aanekoski (Blue) Strong; Aanekoski (Black) Soft; Aanekoski (Birch) Hardwood

Myllykosken Paperitehdas Oy
Myllykoski
Wet groundwood
Brand: Myllykoski "K" and "KB" (bleached)

Nokia Ab
Nokia
Sulfite, unbleached
Special grades
Standard grades
Brands: Nokia (Green) E Extra Strong; Nokia (Blue) E Strong; Nokia (Black) E Bleachable

Oulu Oy
Oulu
Sulfate, unbleached
Special grades
Standard grades
Brands: Oulu (Green) Extra Strong; Oulu (Blue) Strong
Sulfate, semi-bleached
Brands: Oulu Polaris 55, 60, 65, 70, 75

Rauma Repola Oy
Rauma
Sulfite, bleached
Dissolving and special grades
Brands: Rauma R, RR, RRR, for Rayon

Rosenlew W. and Co., Ab
Björneborg
Sulfite, bleached
Dissolving and special grades
Standard grades
Brands: Rosenlew VR, VS, J, VV, Alpha; F for photo; VP for parchment; Rosenlew (Black) Soft; Rosenlew (Blue) Strong; also semi-prime qualities

Serlachius, G.A., Oy
Mantta
Sulfite, bleached
Special grades
Standard grades
Brands: G.S. (Blue) Strong; G.S. (Green) Extra Strong; G.S. (Green) G. Extra Strong Glassine
Sulfite, unbleached
Special grades
Standard grades
Brands: G.A.S. (Blue) Strong

Stockfors, Ab
Lovisa
Dry groundwood (in thin sheets)
Standard unbleached
Brand: Stockfors "F"

Sunila Oy
Sunila
Sulfate, unbleached
Special grades
Standard grades
Brands: Sunila (Green) Extra Strong; Sunila (Blue) Strong; Sunila 400; Sunila L&S Light and Strong; Sunila Special Washed
Sulfate, semi-bleached
Brand: Sunila (Semi-T)

Svarta Bruk, Oy, Ab
Svarta
Dry groundwood (in thin sheets)
Standard unbleached
Brand: Svarta "SA"

Toppila, Oy
Oulu-Uleåborg
Sulfite, unbleached
Standard grades—softwood, wet pulp
Brand: Toppila (Blue) Strong; also second and third qualities
Wet groundwood
Brand: Toppila

Veitsiluoto Oy (V.L.)
Veitsiluoto
Sulfite, bleached and unbleached
Standard grades
Brands: (Bleached) V green (chlorine dioxide); V blue (hypochlorite)
(Unbleached) VL green Extra Strong; VL blue Strong

Yhtyneet Paperitehtaat Oy
Mill at: Jämsänkoski
Sulfite, bleached
Standard grades—softwood
Brands: Ilves (Black) Soft
Mill at: Walkiakoski
Sulfite, unbleached
Special grades
Standard grades
Brands: Walkiakoski (Blue) Strong; Walkiakoski BL Bleachable

FRANCE

L'Alfa S.A.
Paris
Bleached esparto

Cellulose d'Aquitaine
St. Gaudens, Haute Garonne
Sulfate, bleached (hardwood)
Standard grades
Special grades

La Cellulose du Rhône
Tarascon
Sulfate, bleached
Soda esparto pulp

Sica, S.A.
Alizy
Dissolving

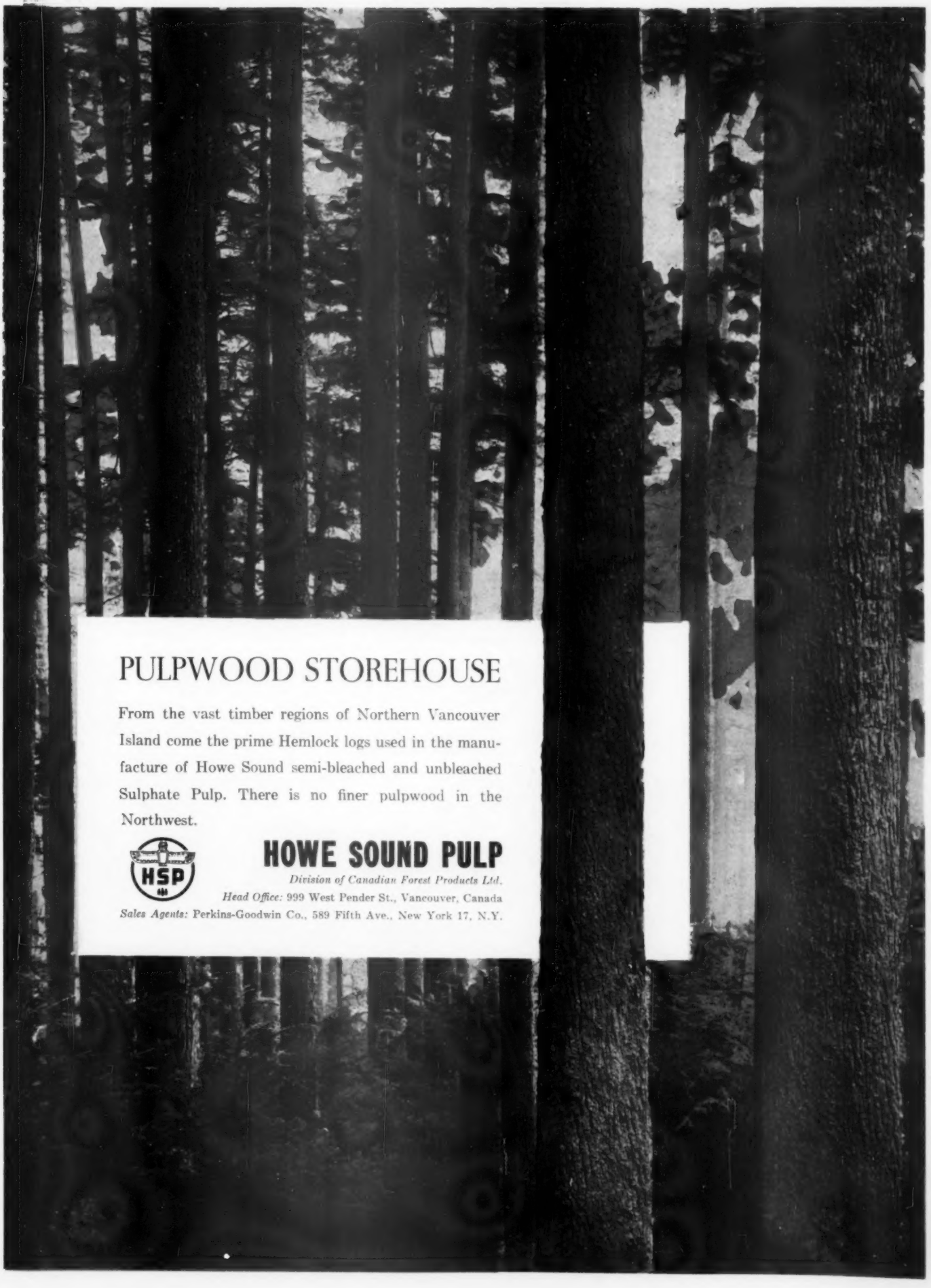
WEST GERMANY

Aschaffenburger Zellstoffwerke AG
Redenfelden, Bavaria
Sulfite, bleached and unbleached
Standard grades
Semi-chemical

Zellstofffabrik Waldhof
Mannheim-Waldhof
Sulfite, bleached and unbleached
Soft and hardwood
Dissolving and related grades
Special grades
Standard grades
Sulfite, unbleached

ITALY

Cartiere Burgo S.p.A.
Piazza Solferino 11, Torina
Mill at: Ferrara
Strawpulp, bleached



PULPWOOD STOREHOUSE

From the vast timber regions of Northern Vancouver Island come the prime Hemlock logs used in the manufacture of Howe Sound semi-bleached and unbleached Sulphate Pulp. There is no finer pulpwood in the Northwest.

HOWE SOUND PULP

Division of Canadian Forest Products Ltd.

Head Office: 999 West Pender St., Vancouver, Canada

Sales Agents: Perkins-Goodwin Co., 589 Fifth Ave., New York 17, N.Y.

JAPAN

Hokuetsu Paper Mills Co., Ltd.
1-475 Zaoh-machi, Nagaoka City, Niigata Pref.
Sulfate, unbleached
Groundwood

Hyogo Pulp Industry Co., Ltd.
20 4-chome, Minami-Honcho, Higashi-ku, Osaka
Sulfate, bleached

Kokoku Rayon and Pulp Co., Ltd.
1 1-chome, Shiba-Tamura-cho, Minato-ku, Tokyo
Sulfite, bleached
Dissolving grades
Standard grades

Kokusaku Pulp Industry Co., Ltd.
8 1-chome, Yuraku-cho, Chiyoda-ku, Tokyo
Sulfite, bleached and unbleached
Sulfate, bleached and unbleached
Dissolving grades
Standard grades

Nagoya Pulp Co., Ltd.
1 4-chome, Horiuchi-cho, Nakamura-ku, Nagoya
Sulfate, bleached and unbleached

Nippon Pulp Industry Co., Ltd.
New Marunouchi Bldg., Tokyo
Mill at: Yonago, Tottori-ken
Sulfate, bleached
Standard grades
Dissolving grades
Mill at: Nichinan, Todaka, Miyazaki-ken
Sulfite, bleached
Dissolving grades
Standard grades
Brand: White 'A"

Sanyo Pulp Co., Ltd.
Marunouchi, Chiyoda-ku, Tokyo
Mills at:
Iwakuni
Gotsu
Sulfite, bleached and unbleached
Dissolving grades
Standard grades
Semichemical, unbleached
Brands: Sanyo DP (Viscose); Sanyo DPP (Plastics); Sanyo DPF (Cellophane)

Taiko Paper Mfg. Co., Ltd.
10 Kamiyokowari, Fuji City, Shizuoka Pref.
Branch office:
Yushima Bldg. No. 1-4 chome Yushima, Bunkyo-ku, Tokyo
Sulfate, unbleached
Special grades

Taio Paper Mfg. Co., Ltd.
655, Mishima-cho, Iyo-Mishima City, Ehime Pref.
Sulfite, unbleached
Sulfate, bleached and unbleached
Groundwood
Semichemical, bleached, unbleached

Takahagi Pulp Co., Ltd.
18 2-chome, Marunouchi, Chiyoda-ku, Tokyo
Sulfate, bleached and base paper

Tohoku Pulp Co., Ltd.
2 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Mill at: Akita
Sulfite, bleached and unbleached
Dissolving grades
Standard grades
Groundwood

Toyo Pulp Co., Ltd.
c/o Tekko Bldg., 1 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Sulfate, unbleached

Tsurusaki Pulp Co., Ltd.
Dojima Bldg., 50, Kinugasa-cho, Kita-ku, Osaka
Sulfate, unbleached and bleached

THE NETHERLANDS

Coop. Stroocartonfabriek "DE EENDRACHT" G.A.
Appingedam
Bleached Monosulfite straw pulp
Brand: A 1

N.V. Stroostoffabriek "PHOENIX"
Veendam
Bleached sulfate straw pulp, dry
Brand: Phoenix "Superior"

N.V. Maatschappij tot Stroveredeling "SOVE"
Arnhem
Bleached Celdecor-Pomilio straw pulp, dry
Brand: Sove

NORWAY

Borregaard, A/S
Sarpsborg
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Brands: VS; Super VS Super A 1; Super A 1 Photo; Super A 1 Photo Soft; Super Plast

A/S Egelands Verk
Söndeled p.a.
Mill at: Söndeled near Risör
Groundwood, dry and wet

Fostvedt A/S
Holt pr. Tvedestrand
Groundwood (aspen and spruce)

Greaker Cellulosefabrik A/S
Greaker
Sulfite, bleached
Special grades
Standard grades
Brand: Greaker Sunshine

Gulskogen Cellulosefabrik A/S
Drammen
Sulfite, unbleached

Katfos Fabriker, A/S
Geithus
Sulfite, unbleached

A/S And. H. Kiaer & Co., Ltd.
Torp
Sulfate, unbleached
Standard grades
Brand: Torp

Krogstad Cellulosefabrik A/S
Mjöndalen
Sulfite, bleached
Standard grades

Lövenskiold-Fossum
Fossum pr. Skien
Mill: Myren Tresliperi
Groundwood

Mathiesen-Eidsvold Vaerk
Bön
Sulfite, bleached
Dissolving grades
Standard grades
Brands: Eidsvold Pulp Super 1 IBX Normal; EPP and EPPS

Mjöndalen Cellulose A/S
Mjöndalen
Sulfite, bleached
Standard grades
Special grades
Brands: "BA"; "BAS"; "BAS-G"; "BAS-T"

A/S Namdalens Traesliperi
Owner: A/S Van Severen & Co., Ltd., Namsos (Post: Namsos; goods Lauvsnes)
Groundwood, hotground white

Saugbrugsforeningen
Halden
Sulfite, bleached
Dissolving grades
Brands: C.D. Extra
Super I; C.D. Extra
Special (normal grades)

A/S Skrankefos Traesliperi
Fall st., S. Land
Groundwood, wet
Extra fineground and news

A/S Songe Traesliperi
Songe
Groundwood, wet
Brand: SONGE

Tinfos Papirfabrik
Notodden
Groundwood
Brand: TP. Hot Ground

Tofte Cellulosefabrik A/S
Oslo
Sulfite, bleached
Longfibered, Softwood
Special grades
Standard grades

Toten Cellulosefabrik A/S
Nygaard Station
Gjövikbanen
Sulfite, bleached
Standard grades
Brands: Toten TTT Prime Bleached

Vestfos Cellulosefabrik A/S
Vestfossen Railway Station
Vestfossen
Sulfite, bleached
Special grades
Standard grades

Viul Tresliperi, A/S
Viul Station
Hönefoss
Groundwood, dry and wet

PORTUGAL

Caima Pulp Co., Ltda
Praca do Municipio, 287, Porto
Sulfite, bleached (Eucalyptus)

Companhia Portuguesa de Celulose
Rua Castilho, 90-50-Lisboa
Mill at: Cacia
Sulfate, bleached, semi-bleached and unbleached, soft and hardwood
Groundwood

AND NOW THERE ARE FOUR

Balanced Paper-Grade Pulps . . . Created by Papermakers for Papermakers

ALBACEL • ASTRACEL • MIRACEL • HYDRACEL

Throughout the free world, papermakers use and like Riegel Pulps . . . paper-grade pulps that provide the right balance of all important qualities . . . brightness, cleanliness, strength, formability and proper bearing characteristics. To increase the versatility and economy of our pulps, we have developed two new grades, Miracel and Hydracel. These retain all the fine characteristics of Albacel and Astracel . . . and, in addition, have been prehydrated to facilitate blending with other fibers.

RIEGEL PAPER CORPORATION

260 MADISON AVENUE, NEW YORK 16, N. Y.

SWEDEN

Bäckhammars Bruk A/B
Björneborg
Sulfate, unbleached
Brand: Bäckhammar Three Star Kraft

Bengtsfors Sulfitaktiebolag
Bengtsfors
Sulfite, bleached
Standard grades
Brands: Bengtsfors Prime B 1.
Dissolving and related grades
Brands: Corona Super I; Corona Super II; Corona USA

Bergvik och Ala A/B
Söderhamn
Sulfite, bleached
Brands: Superwhite S, Circle S, G
Sulfite, unbleached
Brands: Bergvik S, Circle S, G (Mitscherlich grades)
Sulfate, unbleached
Brands: Sandarne: Prime, Circle, Star

Billerud A/B
Säffle
Sulfite, bleached and unbleached
Standard grades
Dissolving grades
Brand: Billerud Eagle

Bure A/B
Burea
Groundwood, dry
Brand: Bure

Dynäs A/B
Väja
Sulfate, unbleached
Brands: Dynas; Dynas Chlorine No. 5

Eds Cellulosafabriks A/B
Eds Bruk
Sulfate, unbleached
Special grades
Brands: Eds Two Stars Soft A; Light & Strong Kraft

Edsvalla Bruk, A/B
Edsvalla
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Brands: Edsvalla VS; Edsvalla Super VS; Edsvalla Superaceta

Fiskeby Fabriks A/B
Skärblacka-Ljusfors
Sulfite, unbleached
Standard grades
Paper grades
Sulfate, unbleached

Forss A/B
Köpmanholmen
Sulfate, bleached
Special grades
Standard grades
Sulfate, unbleached
Special grades
Brands: Forss MB, Forss HL
Sulfite, bleached
Standard grades
Viscose
Brands: Forss Star

Forsse Woodpulp Mill
Oesterforse
Groundwood
Special unbleached dry

Hellefors Bruks A/B
Hellefors
Sulfite, strong and easy bleaching
Brands: HB Strong; HB EB

Hissmofors A/B
Krokom
Sulfite, bleached
Standard grades
Brand: Elkhead

Hogfors Trasliperi, A/B
Häggenäs
Groundwood
Special unbleached
Standard unbleached

Hylte Bruks A/B
Hyltebruk
Sulfite, bleached
Special grades
Standard grades
Brands: Hylte HBA Prime bleached sulfite

Iggesunds Bruk, A/B
Iggesund
Sulfite, bleached
Standard grades
Sulfate, bleached
Special grades
Standard grades
Groundwood
Brands: Golden Anchor, Special, White Anchor

Katrinefors A/B
Mariestad
Sulfite, unbleached
Semichemical
Brand: Katrinefors

Klippans Finpappersbruk A/B
Klippan
Mills at:
Böksholm
Lessebo
Sulfite, bleached, soft and hardwood

Kopparfors A/B
Ockelbo
Sulfate, bleached
Special grades
Super grades
Standard grades
Sulfate, unbleached
Special grades
Brands: Norrland One Star; Norrland Three Star; Norrland Four Star

Korsnäs A/B
Gävle 2
Sulfite, bleached
Dissolving grades
Chlorine dioxide bleached paper grades
Sulfate, bleached
Chlorine dioxide bleached paper grades
Sulfate, semi-bleached, unbleached
Brands: Korsnäs Silk, Super I grand and Normal grade; Roburwite Extra, Prime Mitscherlich Sulfite; Roburwite MS, Medium Strong Sulfite; Korsnäs Tissue, bleached Sulfite; Vigorwite Extra bleached Kraft; Manila 58, Manila 68, semi-bleached Kraft; Korsnäs Kraft, unbleached Sulfate

Mackmyra Sulfit A/B
Mackmyra
Sulfite, unbleached
Special grades
Brands: MS; M

Marma-Langrörs A/B
Söderhamn
Mill at: Marmaverken
Sulfate, semi-bleached and unbleached
Brand; Lj Kraft
Mill at: Vallvik
Sulfite, bleached and unbleached
Brands: Lj White Crown; Lj Polar Bear; Lj Polar Bear Birch; Lj EB; and Lj Crown
Mill at: Lottefors
Groundwood, dry white
Brand: L
Mill at: Järpen
Groundwood, dry white fineground
Brand: J

Mo och Domsjö A/B
Main office: Ornsköldsvik
Sales office: Strandvagen 1, Stockholm
Mill at: Husum
Sulfate
Prime bleached soft and hardwood paper grades
Brands: Husum Extra White Prime Bleached; Husum White Birch Prime Bleached; Husum Prime Unbleached
Mills at:
Domsjö
Hornefors
Sulfite
Prime bleached soft and hardwood paper grades
Special grades
Dissolving grades
Brands: White Horse Strong Prime Bleached; White Horse Greaseproof Prime Bleached; White Horse Blend; White Horse 2919; Silverleaf Birch Prime Bleached; White Aspen Special Prime Bleached; Modocell; Modosilk; Modosilk Extra; Modosilk Super; Modocord; Modoceta; Modofoto; Modoplast; Modolint

Molnbacka-Trysil, A/B
Forshaga
Sulfite, bleached
Dissolving and related grades
Standard grades
Brands: Forshaga VS; Forshaga Super VS; Forshaga "F:Haga" and "F:Haga ST"

Munkedals A/B
Munkedal
Sulfite bleached
Standard grades, soft and hardwood
Brands: Munkedal SGR; SAB

Munksjö A/B
Jönköping
Sulfate, bleached
Standard grades
Brand: Aspa

Oskarström Sulphite Mills A/B
Oskarstrom
Sulfite
Brands: Easy bleaching TT; Strong PP

Rockhammars Bruks A/B
Sällinge
Groundwood, moist
Brand: Rockhammar

Rottneros Bruk, A/B
Sales office:
Slottsbron
Mill at: Rottneros
Groundwood, wet
Brand: Crowned R

Sandvikens Cellulose A/B
Sandviken
Sulfate, unbleached
Special grades
Brands: S Crown S; Special Cable

GILMAN

3 Generations of Paper Making

Unbleached Long Fiber Kraft PULP

Bleached Sulphate BOARD

Bleached and Unbleached Kraft PAPER

and Converted PAPER PRODUCTS

including Gummed Tape, Wrapping, Grocery Bags-Sacks, Multiwall Bags, Cellucord® (kraftcord yarn)

Above: View of Southern Mill and Converting Plants at St. Marys, Georgia, indicating new 300,000 sq. ft. multiwall and grocery bag converting plant.

Left: View of Northern Mill and Converting Plants at Gilman, Vermont.

Subsidiaries:
ST. MARYS KRAFT CORPORATION
KRAFT BAG CORPORATION
CELLUCORD CORPORATION

GILMAN PAPER COMPANY

Sales Offices: International Building, 630 Fifth Avenue
Rockefeller Center, New York 20, N. Y.

Scharins-Soner A/B
Clemensnas
Groundwood
Standard unbleached—dry
Brand: Skelleftea

Skogsagarnas Cellulosa A/B
Monsteras
Sulfate, semi-bleached, unbleached
Brand: The Key Brand

Slottsbrons Träförädlings A/B
(subsidiary of Rottneros Bruk)
Slotsbron
Groundwood, wet
Brand: Slottsbron
Softwood
Brands: Crown ROS; Crown, ROS

Statens Skogsindustrier, A/B
Box 540, Stockholm 1
Mill at: Karlsborgs Bruk, Karlsborgverken
Sulfate, bleached and unbleached
Brands: Royal Bl. Kraft; Royal Kraft

Stjernfors-Ställdalen A/B
Ställdalen
Sulfite, unbleached
Standard grades
Brand: Ställdalen SS

Stora Kopparbergs Bergslags A/B
Falun
Sulfite, bleached (Stora 59)
Super grade
Sulfate, bleached (Stora 32)
Super grade
Sulfate, bleached birch (Stora 61)
Super grade
Brands: Stora 59; Stora 32; Stora 61

Storviks Sulfit A/B
Ockelbo
Sulfite, unbleached
Special grades
Super grades
Brands: Storvik HS Extra Prime Strong Unbleached Mitscherlich Sulfite; Storvik Strong Unbleached Mitcherlich Sulfite HS_2

Ströms Bruks A/B
Stromsbruk
Sulfite, bleached
Dissolving and related grades
Standard grades from spruce, aspen and birch
Brand: Strom

Svano A/B
Svanobruk
Sulfite, unbleached
Special grades
Standard grades
Brands: White Swan; White Swan EB; H; S

Svenska Cellulosa A/B
Sundsvall
Sulfite, bleached
Dissolving and paper grades
Sulfite, unbleached
Sulfate, bleached and unbleached
Groundwood, moist
Brands: Sulfite, bleached, dissolving grades: Pulpcose, Pulpcose Crown
Sulfite, bleached, paper grades: Svartvik Select (Book grade), Svartvik Bond (Bond grade), Essvik 3 Stars (Book grade), Essvik Select (Book grade), Essvik G (Glassine grade)
Sulfite, unbleached: Kramors AA (Strong), Kramfors Puritan (Glassine grade), Kramfors 3 Crowns (Easy-bleaching)
Sulfate, bleached: Ostrand W88 (Pine), Ostrand X90 (Birch)
Sulfate, unbleached: Ostrand Nensjo, Obbola, Munksund
Groundwood, moist; Lulea, Byske

Uddeholms A/B
Uddeholm
Mill at: Skoghall near Karlstad
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Sulfate, bleached
Dissolving and related grades
Special grades
Standard grades
Groundwood
Brands: Betula; Alba; Ultra; Raya; Lintra; Bl 452; Excelsa; Carta; Cordicel; V-pulp; White Kraft

Utansjö Cellulosa A/B
Utansjö
Sulfite, unbleached
Brands: U Crown S, U Crown S STRONG, PRIME; USB, USB STRONG, Half Prime; USS Second Quality; USU Refined Screenings

Wifstavarfs A/B
Vivstavarv
Sulfite bleached and unbleached
Special grades
Standard grades
Sulfate, unbleached
Standard grades
Brands: Superior; Prime Strong No. 170; Prime Strong Standard No. 160 and 135

Wikmanshytte Bruks A/B
Wikmanshyttan
Dissolving
Brands: Thurbo

SWITZERLAND

Cellulosefabrik Attisholz AG
Luterbach
Sulfite, bleached and unbleached

Dozière S.A., Fabrique de cellulose
Delémont
Semi-chemical

Fabrique de Pâtes de Bois de la Doux
St.-Sulpice
Groundwood

Papierfabrik Perlen
Perlen
Sulfite, bleached and unbleached

UNITED STATES

Alaska Lumber & Pulp Co.
Mill at: Sitka, Alaska
Sulfite, bleached
Dissolving grades
Standard grades

American Wood Board Co.
Schuylerville, N.Y.
Groundwood
Standard, unbleached

Arizona Pulp & Paper Co.
Flagstaff, Ariz.
Dry unbleached groundwood

Bowaters Carolina Corp.
Mill at: Catawba, S.C.
Sulfate, bleached, semi-bleached and unbleached

Bowaters Southern Paper Corp.
Mill at: Calhoun, Tenn.
Sulfate, semi-bleached

Brown Co.
General Sales Office:
150 Causeway St., Boston 14, Mass.
Branch Offices:
500 Fifth Ave., New York 36, N.Y.
Prudential Plaza, Chicago 1, Ill.
681 Market St., San Francisco, Calif.
Montreal (Brown Forest Products Ltd.)
Castle Bldg., 1410 Stanley St.
Mill at: Berlin, N.H.
High Alpha, dissolving and paper grade fibers
Soft and hardwood
(Sulfite base)
Screenings, sulfite, sulfate
Brands: Solka; Solka Soft P.P.O.; Solka Soft Alpha; Solka Dur Sylvan; Solka Dur Natus; Solka Special Dur Albas; Solka Floc

Brunswick Pulp & Paper Co.
Mill at: Brunswick, Ga.
Sulfate, bleached
Grades—pine, hardwood
Brand: Brunswick

Buckeye Cellulose Corp.
General Sales Office:
2899 Jackson Ave., Memphis 8, Tenn.
Mill at: Foley, Fla.
Sulfate, bleached
Dissolving grades
Paper grades

Champion Paper & Fibre Co.
Executive Office: Hamilton, O.
Mills at:
Hamilton, O.
Canton, N.C.
Pasadena, Texas
Sulfate, bleached
Semi-bleached
Bleached-hardwood
Brands: Dixie ClO_2 Prime Bleached Sulfate; Lone Star Prime Semi-Bleached Sulfate; Prime Bleached Hardwood Sulfate

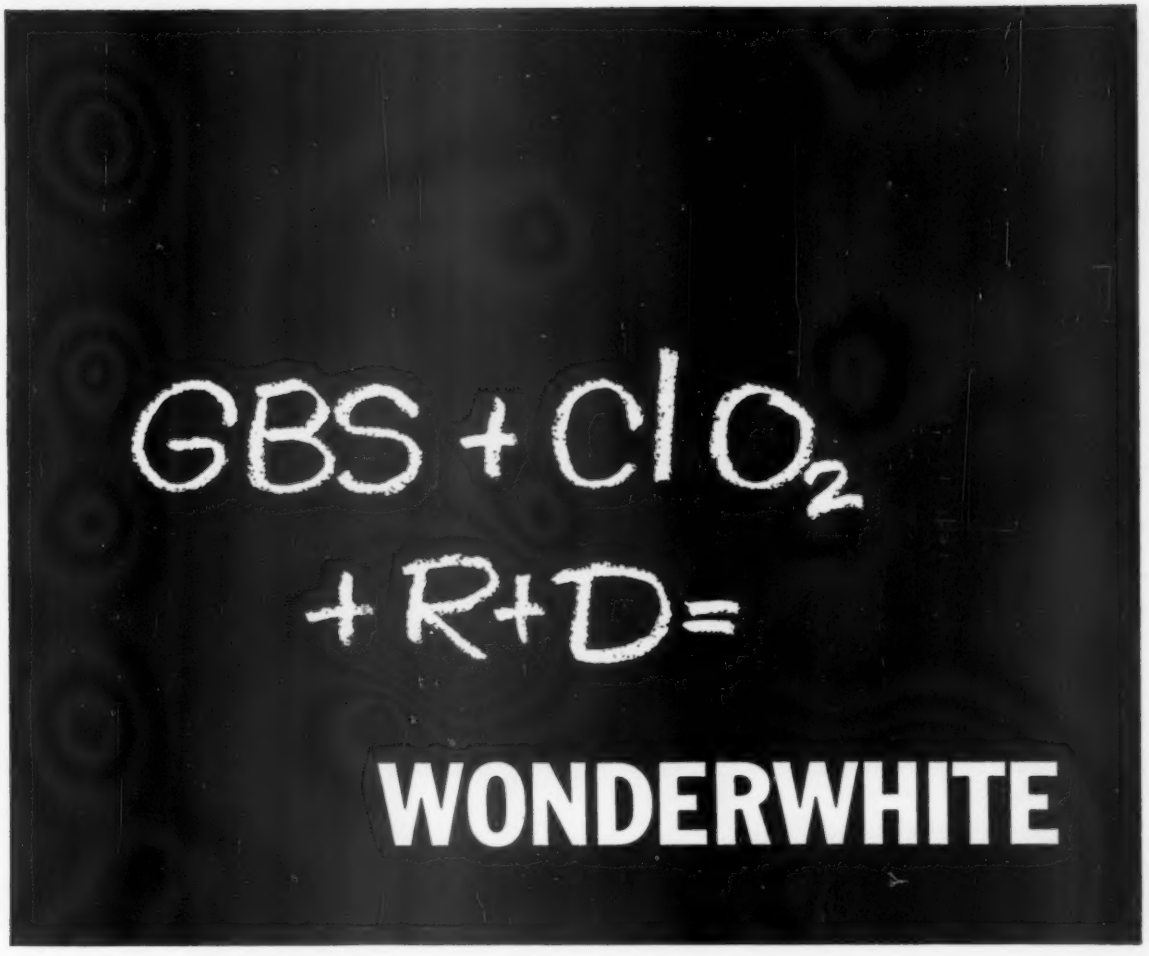
Chesapeake Corp. of Virginia
West Point, Va.
Sulfate, unbleached
Standard grades
Brands: Chesapeake Prime Unbleached Kraft and Chesapeake Prime Unbleached Kraft (soft cook)

Container Corp. of America
Main Office:
38 S. Dearborn St., Chicago 3, Ill.
Mill at: Fernandina, Fla.
Sulfate, unbleached
Special grades
Brand: Conus

Coosa River Newsprint Co.
Coosa Pines, Ala.
Sulfate, bleached

Crown Zellerbach Corp.
Executive Office:
One Bush St., San Francisco 19, Calif.
Mill at: Camas, Wash.
Sulfite, bleached, unbleached
Sulfate, bleached, unbleached
Mill at: Port Townsend, Wash.
Sulfate, unbleached

East Texas Pulp & Paper Co.
Evadale, Texas
Sulfate, bleached
Soft and hardwood
Brand: Eastex



Gaspesia Bleached Sulphite *plus* Chlorine Dioxide *plus* Research and Development equal WONDERWHITE

You have been hearing a great deal about this new Gaspesia Bleached Sulphite Pulp with Chlorine Dioxide which is now coming from our mill in Quebec. We call it WONDERWHITE because performance records are topping even our laboratories' predictions.

Our Research and Development give WONDERWHITE a strength surpassing that of any other sulphite now on the market. At the same time, WONDERWHITE retains the excellent formation plus printing characteristics and excellent opacity of a good spruce sulphite.

Another plus: Chlorine Dioxide gives WONDERWHITE unsurpassed brightness and guarantees the highest degree of cleanliness.

Order a trial shipment—and let WONDERWHITE tell its own story.

GASPESIA SULPHITE COMPANY LTD.
CHANDLER, QUEBEC, CANADA

SOLD BY: **Anglo Paper Products, Ltd.**
2055 Peel Street, Montreal 2, Quebec

SALES REPRESENTATIVE IN THE UNITED STATES:
Northeastern Paper Sales, Inc.
400 Madison Avenue, New York 17, N.Y.
20 North Wacker Drive, Chicago 6, Ill.

Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
Executive Office:
Bangor, Me.
Mills at:
Lincoln, Me.
South Brewer, Me.
Sulfite, bleached
Sulfate, bleached
Soft and hardwood
Brand: Purocell

Georgia-Pacific Paper Co.
Main office:
Equitable Bldg., Portland, Ore.
Mill at: Toledo, Ore.
Sulfate, unbleached

Gulf States Paper Corp.
Gulf States Pulp Sales Division, Demopolis, Ala.
Mill at: Demopolis, Ala.
Sulfate, bleached
Soft and hardwood
Brand: Lo Thermo

Halifax Paper Co. Inc. (division of Albemarle Paper Mfg. Co.)
Roanoke Rapids, N.C.
Sulfate, partially bleached
Sulfate, unbleached
Standard grades
Brand: Albemarle

Hollingsworth & Whitney Div. Scott Paper Co.
Front and Market Sts., Chester, Pa.
Mills at:
Madison, Me. (Groundwood)
Mobile, Ala. (Sulfate)
Sulfate, bleached and semi-bleached

International Paper Co.
Executive Office:
220 E. 42nd St., New York 17, N.Y.
Mills at:
Natchez, Miss.
Springhill, La.
Sulfate, bleached and unbleached
Standard grades
Dissolving grades
Brands: Novocell; Tenacell; Supercell

Ketchikan Pulp Co.
General office:
300 Laurel St., Bellingham, Wash.
Mill at: Ketchikan, Alaska
Sulfite, bleached
Dissolving grades
Standard grades

Marathon Southern Corp. (subsidiary of Marathon, Div. of American Can Co.)
Sales office:
Menasha, Wis.
Mill at: Naheola, Ala.
Sulfate, bleached
Brands: Naheola Bleached Hardwood Kraft; Naheola Bleached Sotfwood Kraft

The Mead Corp.
Mill at: Kingsport, Tenn.
Soda, bleached
Brand: Mead

New York & Pennsylvania Co.
425 Park Ave., New York 22, N.Y.
Mill at: Willsboro, N.Y.
Soda, bleached

Owens-Illinois Mill Div.
(formerly National Container Corp.)
Executive Office:
405 Madison Ave., Toledo, O.
P.O. Box 1035, Toledo 1, O.
Mills at:
Big Island, Va.
Jacksonville, Fla.
Jaite, O.
Tomahawk, Wis.
Valdosta, Ga.
Sulfate, unbleached
Standard grades

Oxford Paper Co.
Executive Office:
230 Park Ave., New York 17, N.Y.
Mill at: Rumford, Me.
Sulfate, bleached and unbleached
Hardwood
Brand: Harbrite

Penobscot Chemical Fibre Co.
Executive and sales office:
211 Congress St., Boston, Mass.
Mill at: Old Town, Me.
Sulfite, chlorine dioxide bleached paper grades, softwood and hardwood glassine grade, softwood
Soda, chlorine dioxide bleached
Sulfate, hardwood chlorine dioxide bleached
Brand: Penobscot

Potlatch Forests, Inc.
Lewiston, Ida.
Sulfate, bleached

Puget Sound Pulp and Timber Co.
Bellingham, Wash.
Sulfite, bleached

Rayonier Inc.
Executive & sales office:
161 E. 42nd St., New York 17, N.Y.
Mills at:
Fernandina Beach, Fla.
Hoquiam, Wash.
Jesup, Ga.
Port Angeles, Wash.
Shelton, Wash.
Chemical cellulose
Sulfite, bleached standard paper grades
Sulfate, bleached standard paper grades
Soft and hardwood
Brands: Cellunier; Cordenier; Hicolor; Nitration Cellulose; Purayonier; Rayaceta; Raybrite; Rayocord; Rayocord-X; Rayofiber; Special Acetate Cellulose; Tokusufu; Georgianier; Raybond; Rayphoto; Rayweb; Snowhite

Riegel Paper Corp.—Carolina Div.
Executive office: 260 Madison Ave., New York, N.Y.
Mill at: Acme, N.C.
Bleached softwood and hardwood kraft
Brands: Albacel and Astracel

St. Marys Kraft Corp.
St. Marys, Ga.
Sulfate, unbleached
Standard grades

St. Regis Paper Co.
Executive office:
150 E. 42nd St., New York 17, N.Y.
Mill at: Tacoma, Wash.
Sulfate, bleached and unbleached
Superstandard grades
Brand: Tacoma

Scott Paper Co.
West Coast Division
Everett, Wash.
Manager of Pulp Sales
R. M. Heath
Scott Paper Co.
Chester, Pa.
Sulfite, bleached
Dissolving and related grades
Standard grades
Brand: Soundview

Sealright-Oswego Falls Corp.
Fulton, N.Y.
Groundwood
Standard unbleached, bleached

Spaulding Pulp and Paper Co.
Newberg, Ore.
Sulfite, unbleached
Standard grades

Tomahawk Pulp Co.
Tomahawk, Wis.
Branch office:
115 S. Superior St., Appleton, Wis.
Groundwood
Fine tissue grades
Toweling and free board
Grades to specifications

Washington Pulp and Timber Co.
Longview, Wash.
Groundwood, unbleached

West Virginia Pulp and Paper Co.
Executive office:
230 Park Ave., New York 17, N.Y.
Mills at:
Mechanicville, N.Y.
Tyrone, Pa.
Williamsburg, Pa.
Luke, Md.
Covington, S.C.
Charleston, S.C.
Sulfate, bleached and unbleached

Weyerhaeuser Co., Pulp and Paperboard Div.
Sales office:
230 Park Ave., New York 17, N.Y.
Branches:
Bank Bldg., Clinton, Mass.
220 S. Michigan Ave., Chicago, Ill.
681 Market St., San Francisco, Calif.
Mills at:
Cosmopolis, Wash.
Everett, Wash.
Longview, Wash.
Springfield, Ore.
Sulfite, bleached
Dissolving and related grades
Standard grades
Sulfate, bleached
Standard grades
Special grades

YUGOSLAVIA

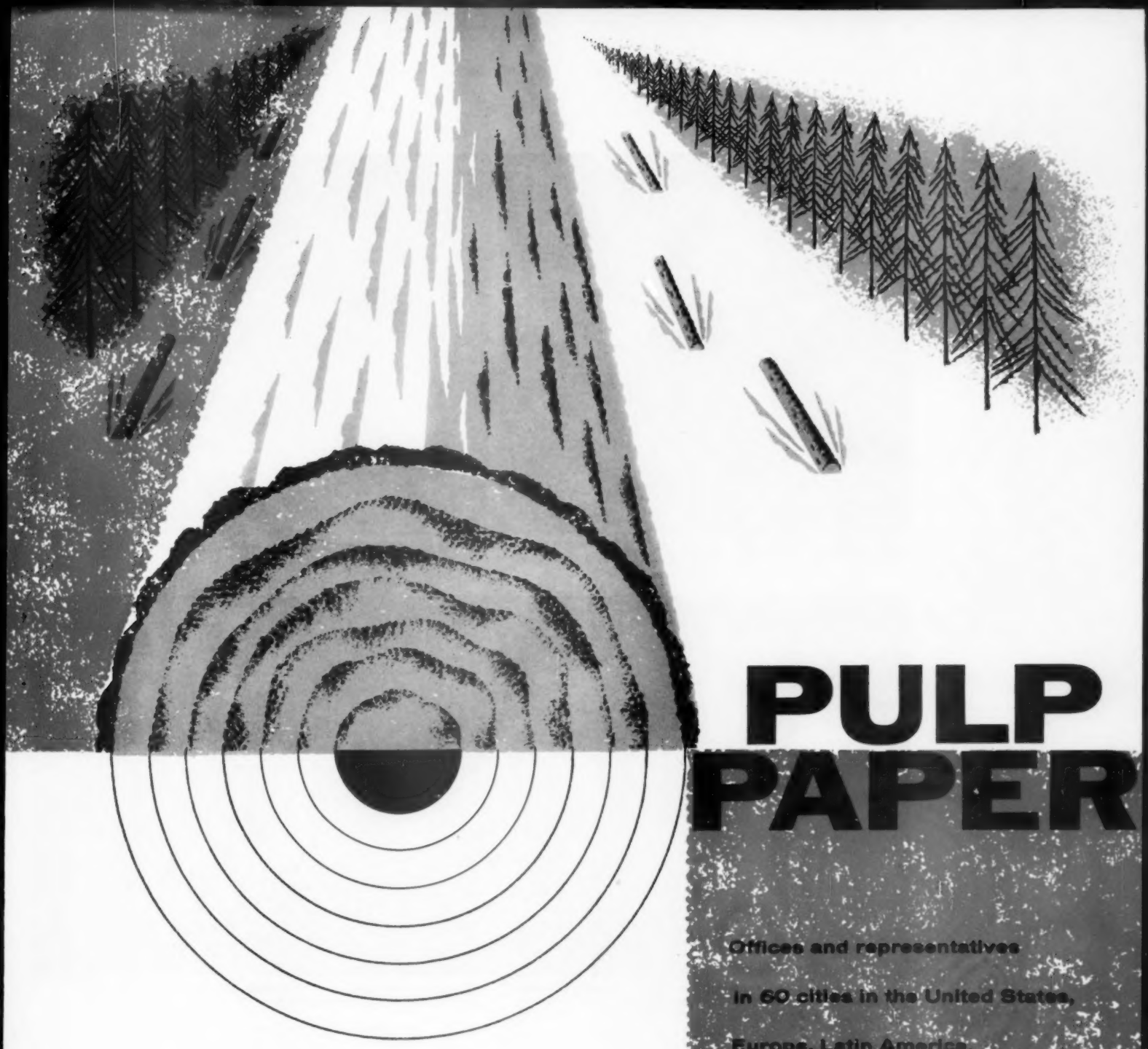
Fabrika Celuloze
Prijedor
Sulfite, bleached and unbleached
Standard grades

Fabrika Celuvoze I Papira "Duro Salaj"
Videm-Krško
Sulfite, bleached and unbleached
Standard grades

Tvornica Sulfatne Celuloze I Natron Papira
Maglaj
Sulfate, bleached and unbleached
Standard grades

Fabrika Sulfitne Celuloze Medvode
Medvode
Sulfite, bleached and unbleached
Standard grades

Zagrebacka Tvornica Papira
Zagreb
Sulfite, bleached and unbleached
Standard grades



PULP
PAPER

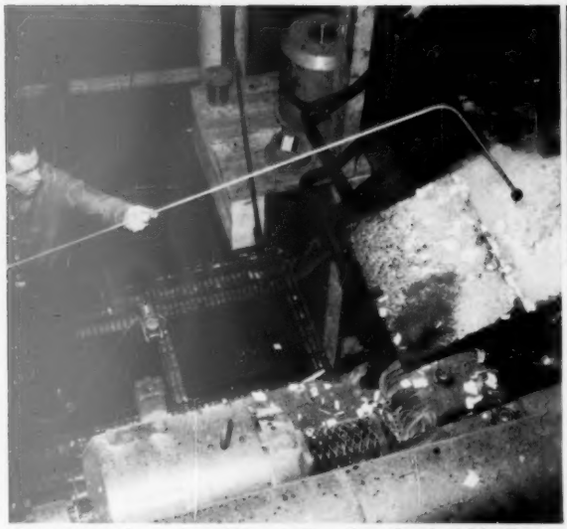
Offices and representatives
in 60 cities in the United States,
Europe, Latin America,
Africa, and Asia.

BULKLEY DUNTON

ORGANIZATION

295 Madison Avenue, New York 17, N. Y.

BULKLEY DUNTON PULP CO., INC. • BULKLEY DUNTON & CO., INC.
BULKLEY DUNTON LTD., LONDON • BULKLEY DUNTON S.A.
BULKLEY DUNTON A.G., ZURICH • BULKLEY DUNTON A.B.,
STOCKHOLM • BULKLEY DUNTON PAPER (FAR EAST) CO., INC.
HEMISPHERE PAPER CO., S.A.
In New England—CARTER RICE STORRS & BEMENT



Actual tests begin by adding radioactive plastic "chips" at chip feeder. Here, a single "chip" is held by vacuum tool.

"Chips" are timed as they enter the top of one of St. Regis' Kamyr continuous digesters.

Thermocouple recorder develops a complete record of temperatures at key points throughout digester.

When "chips" finally reach bottom of digester, crews are alerted to quickly recover them.

Now! St. Regis nuclear research probes

"What actually goes on inside the thick, windowless, steel walls of continuous pulp digesters?"—that's an extremely complex question the pulp industry has never been able to answer completely.

Now St. Regis® better understands the answer—thanks to recent nuclear research studies performed by the Commercial Products Division of Atomic Energy of Canada, Ltd. Conducted by these top Canadian nuclear scientists, the unique research project used thermocouples and nearly a hundred Geiger counters to blanket the huge Kamyr continuous digesters which produce Alberta Hi-Brite pulp.

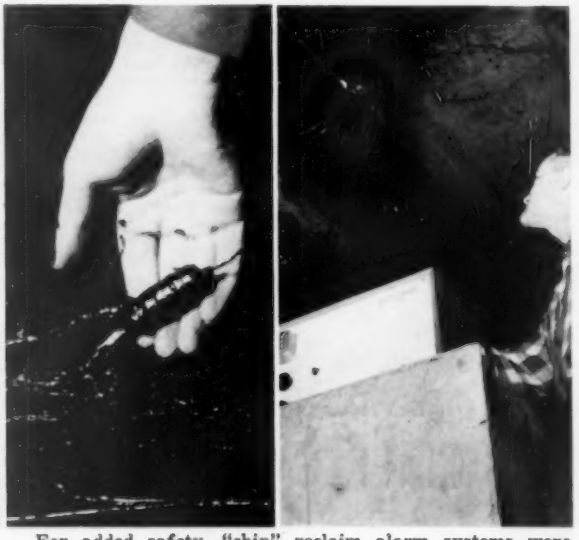
Then radioactive oxide of Lanthanum-140 was encapsulated into special plastic containers that looked like ordinary poker chips. Lanthanum-140 oxide was selected as the tracer because it had adequate strength to penetrate the thick digester walls . . . and because its radioactive charge lasts a relatively short time.

These hot "chips" were fed into the normal chip flow one at a time. Each chip's course was traced by Geiger

Path of every "chip" is carefully traced throughout digester. Here, a hot "chip" is located near top of the digester.

This automatic Geiger counting system traces the path of each "chip" through digester.

"Chips" are recovered with hand tools as they reach the Jonsson knotters, then returned to lead-lined storage vessels for safekeeping.



For added safety, "chip" reclaim alarm systems were spotted along knot conveyor and pipe to black stock storage tank. *Every* hot "chip" was recovered throughout test.

the "hidden secrets" of pulp digesters!

counters and recorded with special electronic systems. At the same time, thermocouples developed temperature data that could be correlated with path of chips.

While the actual on-site research work took just under five days, months of advance preparations were required; in addition, it will take many more months to fully analyze and interpret the data gathered. Armed with this new data, Hinton Mill personnel expect to control the cooking of the Kraft Pulp more closely than has ever before been possible in commercial operation.

The only such research project in North America, this is one more example of St. Regis' continuing effort to improve what many say is the world's finest pulp.

Get the full story on Alberta Hi-Brite Bleached Sulphate Pulp and the advantages it offers you. St. Regis Paper Company, 150 East 42nd St., New York 17, N. Y.

KRAFT DIVISION **St.Regis** PAPER COMPANY

Cross Index of North American Agents and Importers by Companies

Producers of market pulp are shown in boldface type. Where an agent is listed, see preceding directory of producers. Agents' individual listings may be found in succeeding directory of agents and importers.

AUSTRIA

Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Frantschach Zellstoff- und Papierfabrik
Hamburger, W.
Holzstoff-Verkaufsstelle GmbH
Kellner-Partington Paper Pulp Co. Ltd.
Borregaard Co., Inc.
Lenzinger Zellulose- und Paperfabrik AG
Leykam-Josefsthal AG
Nettingsdorfer Papierfabrik AG
Neusiedler AG
Pölser Zellulose- und Papierfabrik AG
Steyrermühl AG
St. Michael AG

CANADA

Abitibi Power & Paper Co., Ltd.
Mead Pulp Sales, Inc.
Alliance Paper Mills, Ltd.
Anglo-Canada Pulp and Paper Mills, Ltd.
Anglo Paper Products, Ltd.
Northeastern Paper Sales, Inc.
Anglo-Newfoundland Development Co., Ltd.
Anglo Paper Products, Ltd.
Northeastern Paper Sales, Inc.
Bathurst Power & Paper Co., Ltd.
Bathurst Paper Sales Ltd.
Bowaters Mersey Paper Co., Ltd
The Bowater Paper Co., Ltd.
Bowater's Newfoundland Pulp & Paper Mills, Ltd.
Bowater Paper Co., Inc.
John Breakey, Ltd.
Woodpulp, Inc.
British Columbia Forest Products, Ltd.
Mead Pulp Sales, Inc.
Canada Paper Co.
Howard Smith Paper Mills, Ltd., Pulp Sales Dept.
Canadian Forest Products Ltd.
Perkins-Goodwin Co.
Canadian International Paper Co.
Riordon Sales Corp., Ltd.
Celgar Ltd.
Columbia Cellulose Co. Ltd.
Consolidated Paper Corp., Ltd.
Consolidated Paper Sales, Ltd.
Donnacona Paper Co., Ltd.
Howard Smith Paper Mills Ltd., Pulp Sales Dept.
Dryden Paper Co., Ltd.
Anglo Paper Products, Ltd.
Northeastern Paper Sales, Inc.
Fraser Companies, Ltd.
Gaspesia Sulphite Co., Ltd.
Anglo Paper Products, Ltd.
Northeastern Paper Sales, Inc.
The Great Lakes Paper Co., Ltd.
Canadian Wood Pulp Corp.
Gulf Pulp & Paper Co.
Price & Pierce, Ltd.
Halifax Power & Pulp Co. Ltd.
Gottesman & Co., Inc.
Central National Corp. (for export)
Howard Smith Paper Mills Ltd.
Howard Smith Paper Mills Ltd. [Pulp Sales Dept.]
Irving Pulp & Paper Ltd.
Bulkley, Dunton Pulp Co., Inc.
The KVP Co., Ltd.
Lotbinière Pulp & Paper Co., Ltd.
The James Maclaren Co., Ltd.
Gottesman & Co., Inc.
Central Natl. Corp. (for export)
MacMillan, Bloedel & Powell River Ltd.
Powell River-Alberni Sales Ltd.
Price & Pierce Ltd.
Marathon of Canada, Ltd., Div. of American Can Co.
Minas Basin Pulp & Power Co. Ltd.
Price & Pierce, Ltd.
Mohawk Corp., Ltd.
Castle & Overton, Inc.
North Western Pulp & Power, Ltd.
(subsidiary of St. Regis Paper Co.)
St. Regis Paper Co.
St. Regis Paper Co. (Canada) Ltd.
Ontario Paper Co., Ltd.
Bulkley, Dunton Pulp Co., Inc.
Parsons & Whittemore/Lyddon Organization
Perkins-Goodwin Co.
Provincial Paper Ltd. (Subsidiary of Abitibi Power & Paper Co., Ltd.)
Mead Pulp Sales Inc.
Quebec North Shore Paper Co.
Bulkley, Dunton Pulp Co., Inc.
Parsons & Whittemore/Lyddon Organization
Perkins-Goodwin Co.
Rayonier Canada Ltd.
Rayonier Inc.
Richmond Pulp & Paper Co. of Canada, Ltd.
Kruger Paper Co., Inc.
St. George Pulp & Paper Co., Ltd.
Bulkley, Dunton Pulp Co., Inc.
Woodpulp, Inc.
St. Lawrence Corp., Ltd.
Gottesman & Co., Inc.
Central Natl. Corp. (for export)
St. Lawrence Sales Co. Ltd.
St. Raymond Paper, Ltd.
St. Raymond Sales Ltd.
Soucy, F. F., Inc.
Bulkley, Dunton Pulp Co., Inc.
Spruce Falls Power and Paper Co., Ltd.
Thorold Pulp Co., Ltd.
Thurso Pulp & Paper Co.
Perkins-Goodwin Co.

FINLAND

Ahlström, A., Oy
Pulp Sales Corp.
Eklöf, Aug., Ab
Pulp Sales Corp.
Enquist, J. W., Oy (Sphinx)
Pulp Sales Corp.
Enso-Gutzeit Oy
Pulp Sales Corp.
Haarlan Selluloosayhtio
Pulp Sales Corp.
Jakobstads Cellulosa Ab
Pulp Sales Corp.
Joutseno-Pulp Oy
Pulp Sales Corp.
Kajaani Oy
Pulp Sales Corp.
Oy Kaukas Ab
Pulp Sales Corp.
Kemi Oy
Pulp Sales Corp.
Kymmene, Ab
Pulp Sales Corp.
Lohja-Kotka, Oy
Pulp Sales Corp.
Metsaliiton Selluloosa Oy
Pulp Sales Corp.
Myllykosken Paperitehdas Oy
Nokia Oy
Pulp Sales Corp.
Oulu Oy
Pulp Sales Corp.
Rauma Repola Oy
Pulp Sales Corp.
Rosenlew, W. and Co., Ab
Pulp Sales Corp.
Serlachius, G. A., Oy
Pulp Sales Corp.
Stockfors, Ab
Pulp Sales Corp.
Sunila Oy
Pulp Sales Corp.
Svarta Bruk, Oy, Ab
Pulp Sales Corp.
Topila, Oy
Pulp Sales Corp.
Veitsiluoto Oy (V. L.)
Pulp Sales Corp.
Yhtneet Paperitehtaat
Pulp Sales Corp.

FRANCE

L'Alfa S.A.
Parsons & Whittemore/Lyddon Organization
Cellulose d'Aquitaine
La Cellulose du Rhône
Sica S.A.

WEST GERMANY

Aschaffenburger Zellstoffwerke AG
Zellstofffabrik Waldhof

ITALY

Cartiere Burgo S.p.A.

JAPAN

Hokuetsu Paper Mills Co., Ltd.
Hyogo Pulp Industry Co., Ltd.
Kokoku Rayon Pulp Co., Ltd.
Kokusaku Pulp Industry Co. Ltd.
Nagoya Pulp Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Sanyo Pulp Co., Ltd.
Taiko Paper Mfg. Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Takahagi Pulp Co., Ltd.
Tohoku Pulp Co., Ltd.
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Coop. Stroocartonfabriek "De EENDRACHT" G.A.
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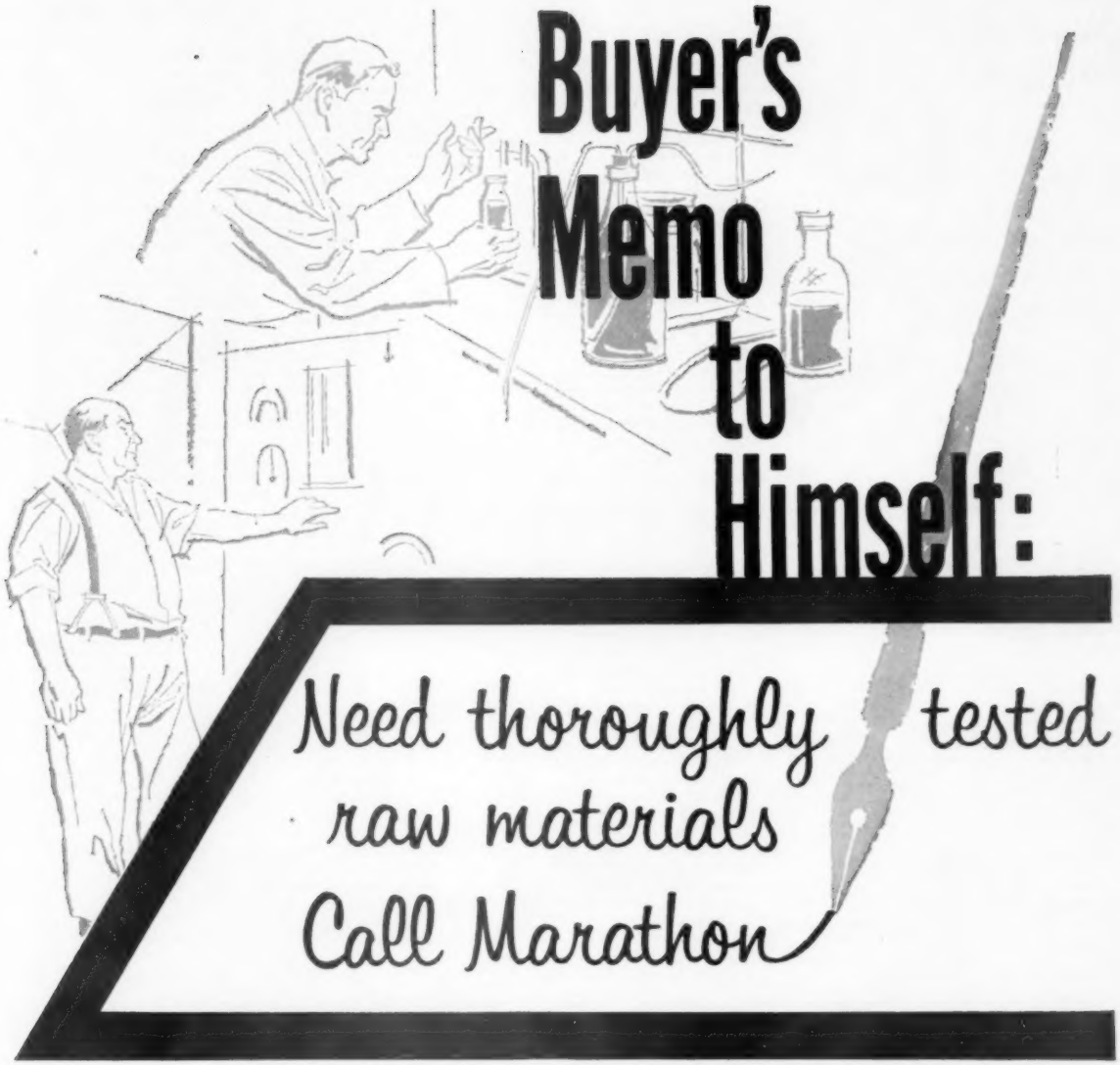
Parsons & Whittemore/Lyddon Organization
N.V. Maatschappij tot Stroveredeling "SOVE"



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Krogstad Cellulosefabrik A/S
Castle & Overton, Inc.
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Hellefors Bruks A/B
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Hissmofors A/B
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Hylte Bruks A/B
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Storviks Sulfit A/B
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Ströms Bruks A/B
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Bowaters Carolina Corp.
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Bowaters Southern Paper Corp.
The Bowater Paper Co., Inc.
Brown Company
Brunswick Pulp & Paper Co.
Mead Pulp Sales, Inc.
Buckeye Cellulose Corp.
Bulkley, Dunton Pulp Co., Inc. (paper grades only)
Champion Paper & Fibre Co.
Castle & Overton, Inc.
Cellulose Sales Co., Inc.
Chesapeake Corp. of Virginia
Castle & Overton, Inc.
Cellulose Sales Co., Inc.
Parsons & Whittemore/Lyddon Organization
Woodpulp, Inc.
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Gottesman & Co., Inc.
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Coosa River Newsprint Co.
Bulkley, Dunton Pulp Co., Inc.
Crown Zellerbach Corp.
East Texas Pulp and Paper Co.
Eastern Fine Paper and Pulp Division Standard Packaging Corp.
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Georgia-Pacific Paper Corp.
Reinhold-Gould, Inc.
Gulf States Paper Corp.
Cellulose Sales Co., Inc. (for export)
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Halifax Paper Co.
(Subsidiary of Albemarle Paper Mfg. Co.)
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International Paper Co.
Gottesman & Co., Inc. (paper grades)
Riordon Sales Corp., Ltd. (dissolving grades)
Ketchikan Pulp Co.
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Stora Kopparberg Corp.
Penobscot Chemical Fibre Co.
Potlatch Forests, Inc.
Bulkley, Dunton Pulp Co., Inc.
Puget Sound Pulp and Timber Co.
Bulkley, Dunton Pulp Co., Inc.
Rayonier Inc.
Rayonier Inc.
Rayonier Export Corp.
Riegel Paper Corp.—Carolina Div.
Bulkley, Dunton Pulp Co., Inc.
Bulkley, Dunton, Ltd.
Central National Corp.
Gottesman & Co., Inc.
Johnsen, Jorgensen & Wettre, Ltd.
St. Marys Kraft Corp.
Gilman Paper Co.
St. Regis Paper Co.
St. Regis Paper Co.
St. Regis Paper Co. (Canada) Ltd.
Scott Paper Co., West Coast Div.
Sealright-Oswego Falls Corp.
Spaulding Pulp & Paper Co.
Perkins-Goodwin Co.
Tomahawk Pulp Co.
Washington Pulp and Timber Co.
West Virginia Pulp and Paper Co.
Weyerhaeuser Co., Pulp and Paperboard Div.

YUGOSLAVIA

Fabrika Celuloze (Prijidor)
Fabrika Celuloze I Papira "Duro Salaj"
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Canada
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Bowater's Newfoundland Pulp & Paper Mills, Ltd.

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Ketchikan Pulp Co.
Potlatch Forests, Inc.
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Riegel Paper Corp.-Carolina Div.
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Soucy, F. F., Inc.
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Spruce Falls Power & Paper Co. Ltd.
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Champion Paper & Fibre Co.
Chesapeake Corp. of Virginia
Norway
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Tofte Cellulosefabrik A/S
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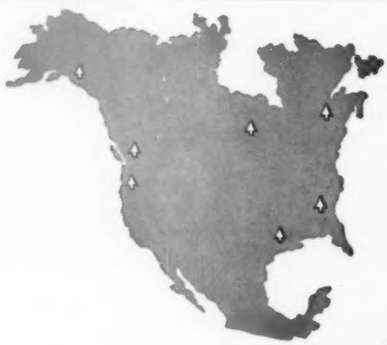
Holland
Coop. Stroocartonfabriek "De Eendracht"
Sweden
Bure A/B



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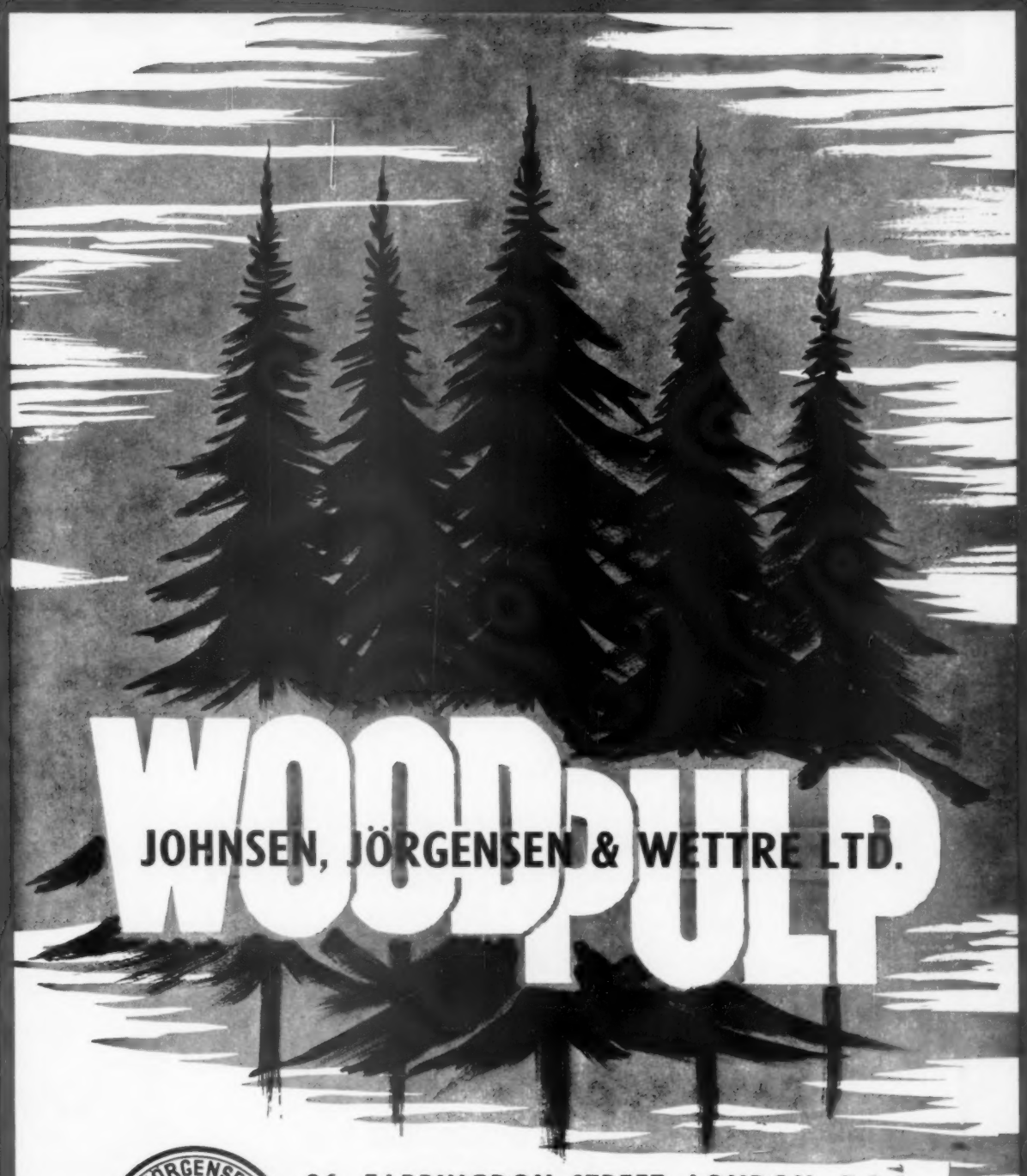

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Hudson Pulp & Paper Corp.
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Riegel Paper Corp.
St. Marys Kraft Corp.
West Virginia Pulp and Paper Co.
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James Maclaren Co., Ltd.
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Mohawk Corp., Ltd.
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Hogsfors Trasliperi, A/B
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Utansjö Cellulosa A/B
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Pulp and Paperboard Division

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Sun Life Bldg., Montreal, Que.
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Minas Basin Pulp & Power Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
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Marma-Långrörs A/B
Norway
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Enquist, J. W., Oy (Sphinx)
Enso-Gutzeit Oy (Tornator, Seal, Gutzeit)
Haarlan Selluloosayhtio
Jakobstads Cellulosa Ab
Joutseno-Pulp Oy
Kajaani Oy
Oy Kaukas Ab
Kemi Oy
Kymmene, Ab (Kuusankoski)
Lohja-Kotka Oy
Metsaliiton Selluloosa Oy (Aanekoski)
Nokia Ab
Oulu Oy
Rauma Repola Oy
Rosenlew, W., and Co. Ab
Serlachius, G. A., Oy (GAS, GS)
Stockfors Ab
Sunila Oy
Svarta Bruk Ab
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Sweden
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St. Regis Paper Co.
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North Western Pulp & Power Ltd.

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360 Bay St., Toronto, Ont.
United States
St. Regis Paper Co.
Canada
North Western Pulp & Power, Ltd.

E. M. Sergeant Pulp and Chemical Co., Inc.
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Ontario Paper Co., Ltd.
John Breakey, Ltd.
St. George Pulp & Paper Co.
United States
Chesapeake Corp. of Virginia
Sealright—Oswego Falls Corp.

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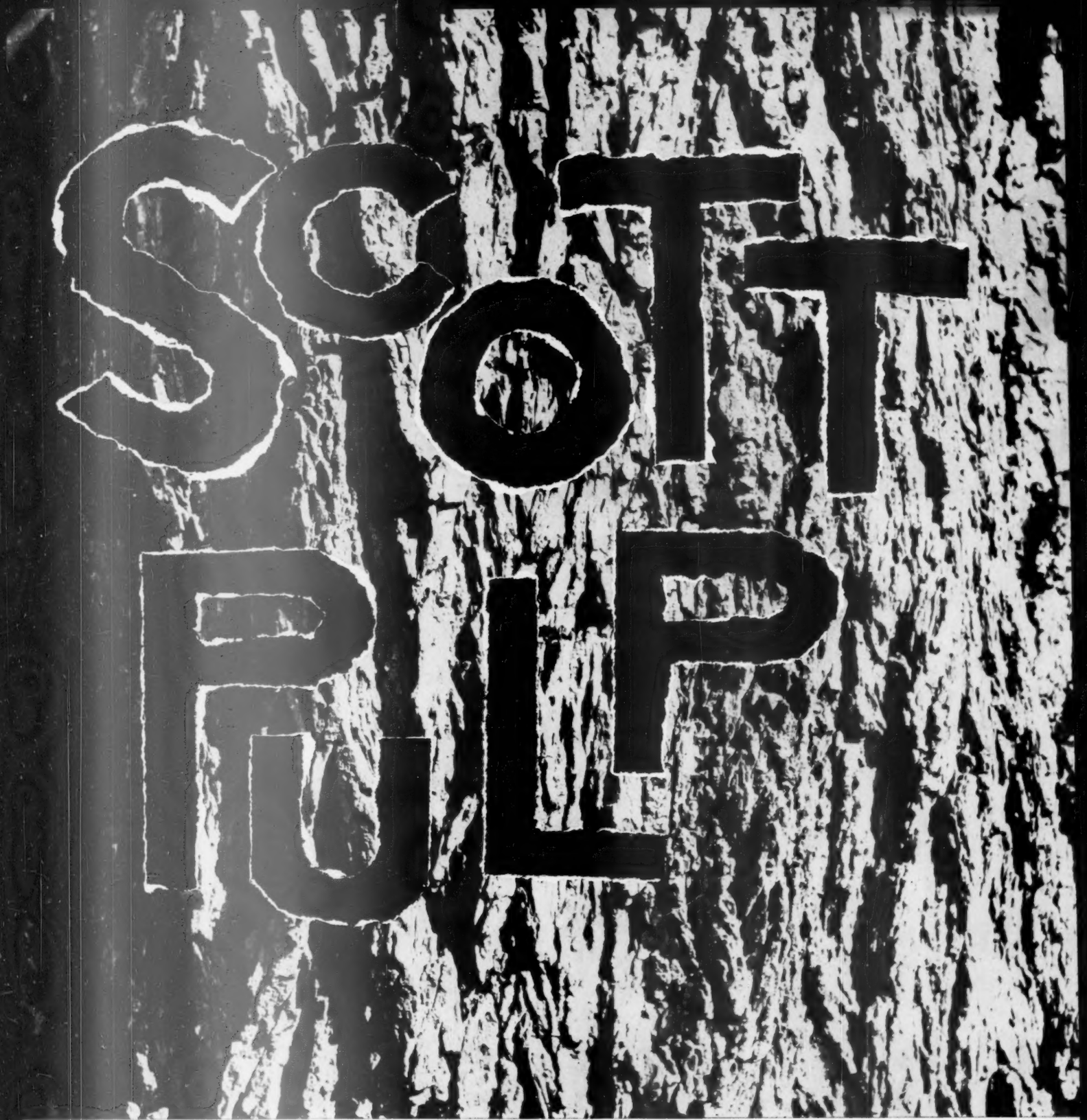

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Dissolving Pulp Future is Bright

An "inside story" of unusual business reveals important worldwide developments in the making. Nylon-rayon wage crucial battle

By REX VINCENT
Vice President and Technical Consultant, Bulkley Dunton Pulp Co.

● For well over 100 years America followed the advice of its first president and remained aloof from foreigners. The traditions and foundations established during those years finally crystallized into a philosophy known as isolationism.

This philosophy not only guided our government but almost unconsciously guided the development of business and industry. Every industry that developed and grew manufactured products for the domestic market with little, if any, thought for international trade. Two world wars and their accompanying aftermath finally destroyed the governmental philosophy of isolationism to the extent that the whole Western world now looks to America as its leader and its protector.

The changing attitude of businessmen has become apparent since the end of the last war and exports are no longer regarded as a nuisance. Overseas trade today is actively solicited, but there is no single American business dependent for its existence on international trade except one, and that is the dissolving pulp business.

Unusual Export Business

This is a most remarkable development when one considers and remembers how young is the export business in woodpulp of any kind and how viciously competitive the business can be from time to time. Further, consider that the U.S. government does not aid export trade in the fashion other governments do, particularly a bulk raw material that contributes nothing to our national defense when it moves overseas. We have no bilateral trade treaties that guarantee payments, our ocean freight lines are in business to make a profit and their rates are determined accordingly, and there is no subsidization for the pulp industry.

In only 12 years the United States has become a factor in the international pulp trade with its pulps being shipped to every corner of the world and in dissolving pulp this activity reached the proportion of 25% of total production in 1958 and held to that level in 1959. In tons, the United States is exporting pulp of all grades at the level of 550,000 to 600,000 per year. Dissolving pulp has been as high as 252,000 and last year was 285,000.

This figure will increase substantially in the next several years. It is automatically built-in due to the new Japanese mill at Sitka, Alaska (Alaska Lumber & Pulp Co.). This mill had a very successful startup in late 1959 and all production is presently going to Japan. Thus, while these export figures will increase, they must not be misleading because the increase will be doing nothing to help the present oversupply problem.

Capacities for North America

The capacity figures for dissolving pulp in North America remain substantially the same as given here last year. There should be recorded a moderate reduction because Rayonier has announced that the Woodfibre Mill in British Columbia is being rebuilt into a bleached kraft paper pulp mill. Also it would seem sensible to remove the Sitka mill from these figures, but to do so would make it necessary to continue to correct the export figures for its shipments, therefore it has been left in the total. Some modification has been made in other capacities, for it seems foolish, for example, to carry a figure when the mill is using only half of it and does not plan to change the proportion.

1960 Operating Capacity

Making these rather minor adjustments the effective operating capacity for 1960 becomes in round numbers 2,000,000 tons, and it must be admitted that this is not a dependable figure. Each and every one of these

MR. VINCENT: ". . . the only American business dependent on world trade. . . ."

mills listed can, of course, make paper pulp and can shift back and forth as business requires, so that at no time can anyone state a figure that represents a capacity strictly for dissolving pulps. The 2,000,000 ton figure represents the installed capacity for making these pulps.

Another aspect is that some of these mills are making very little, if any, pulp for rayon or acetate conversion but are making pulp that is used for various specialty purposes. However, since it falls in the "special alpha" category statistically it must be included. In any event, the capacity, as defined, is in the following mills:

Company	No. of Mills
Rayonier Inc. (two at Jesup, Ga.)	6
Weyerhaeuser Co.	1
Brown Co.	1
International Paper Co.	1
Buckeye Cellulose Corp.	2
Ketchikan Pulp Co.	1
Fraser Companies, Ltd.	1
Canadian International Paper Co.	3
Columbia Cellulose Co., Ltd.	1
Alaska Lumber and Pulp Co.	1

Overseas Capacity Important

There is another capacity for producing these pulps that is becoming

more and more important and that is what lies overseas. Eleven other countries, besides the United States and Canada, produce this pulp and several of them are relative newcomers in the business. France and Turkey only began in 1955 and the Union of South Africa in 1956.

The total capacity of all these mills, including Scandinavia, is about the same as North America, maybe a little larger. The big year to date was 1957 when North America made 1,350,000 tons and the rest of the free world made 1,773,000 tons. In 1958 this relationship was: North America 1,235,000 tons, and rest of free world 1,552,000 tons. Japan has developed a capacity as great, if not greater, than Canada and West Germany is greater than Finland. Sweden and Canada are about the same.

Production in the Scandinavian countries in 1958 was 726,000 tons and in the other countries of Europe added up to 439,000 tons and this "home-grown" tonnage is primarily a child of the last ten years. Germany today is 95% self-sufficient on the basis of 1958 operations. France, another large consumer country, is 33% self-contained, Italy 32%, Japan 91%, Austria 25%.

Why It Grew Abroad

Most of this growth has occurred in the last 10 to 12 years and has been sparked by a whole concert of reasons. Economic recovery, American aid, the development of hardwood processes, nationalism and the desire for an industry that could produce the raw material for smokeless powder if needed.

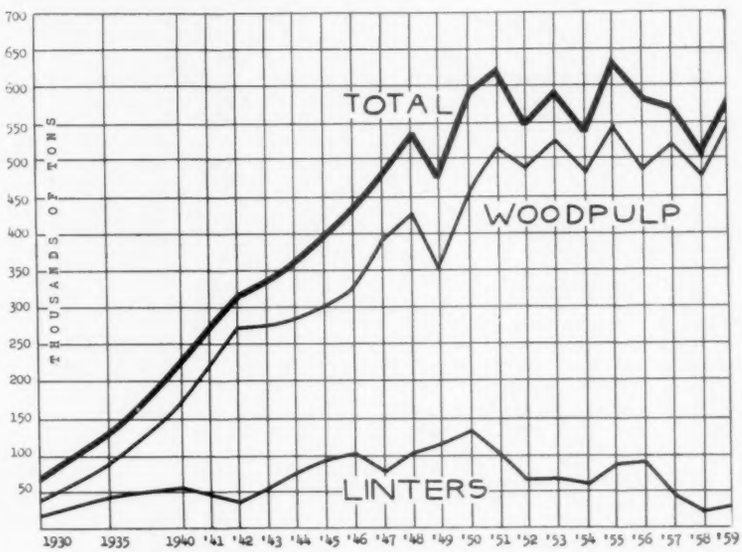
Not the least of all the reasons was the pulp price skyrocket that went up in 1946 and 1947 and again in 1950 and 1951. The rise of this home-grown tonnage has dampened the expected growth of North American exports and as a trend was almost wholly overlooked during the expansion period of capacity in North America.

Whether this overseas production or "home-grown" production continues to grow is dependent largely on technology and competition from other fibers. The present quality produced overseas is not sufficient to produce tire cord or acetate and as the non-cellulosics begin to grow, better and better rayons requiring better and better woodpulps will be required. This aspect is favorable to North American pulps.

What Happened in North America

Now, what did this capacity do in North America in 1959? It turned out 1,451,620 tons; a new high point by 51,000 tons over the previous record year of 1955. This is an increase over 1958 of 215,000 tons or 17%. United States production increased to 1,088,050 and the Canadian to 363,570. These represent increases of 15% for the United States and 18% for Canada. This is not a reversal of a long trend in Canadian production but only a peak in the trend.

A big change for Canada was in its overseas shipments which jumped from 65,000 tons to 103,800 tons. This was a most remarkable shift, bringing the tonnage back to almost exactly the same figure achieved in 1957. This drop and recovery was almost entirely due to the drop in the textile business in Japan in 1958 and its recovery in 1959 and because of the Sitka mill, the statistics of which will appear as American, the Canadian exports for



WOODPULP CONTINUES UPSWING as dominant raw material for rayon-acetate products as role of cotton linters diminishes. For all practical purposes, cotton linters are being eliminated from textile rayon-acetate products.

TABLE I

U. S. PURIFIED WOOD CELLULOSE
(In Short Tons)

Year	*Production*	*Imports*	*Exports*	*Net Available*
1938	171,650	65,220	72,800	164,070
1943	369,731	129,380	22,884	476,226
1944	429,545	132,675	10,729	551,491
1945	355,820	146,030	13,030	488,820
1946	295,680	198,540	9,300	484,920
1947	408,460	248,070	14,570	641,960
1948	421,924	239,842	14,665	647,101
1949	371,422	154,348	3,857	521,913
1950	473,210	238,856	27,284	684,781
1951	615,776	230,038	32,944	812,920
1952	705,828	223,340	61,850	867,315
1953	678,180	255,781	66,513	867,448
1954	775,003	230,384	161,916	843,471
1955	980,875	215,100	207,100	988,875
1956	940,660	201,600	212,100	930,160
1957	1,021,000	188,310	258,190	951,120
1958	930,140	183,700	230,260	883,580
1959	1,085,050	204,480	285,700	1,007,330

Source: U.S.P.P.A.

OVER 80 YEARS' EXPERIENCE
in pulp and related services

Information cannot be inventoried—it is too hard to keep and too perishable. Yesterday's data may be as obsolete as last year's. Still, information on supplies, on prices, and on production is management's most valued tool. For information on pulp and pulp-type products, telephone C & O. One call checks many sources. Call "C & O".

WOOD PULP
Representing:
Champion Paper & Fibre Co.
The Chesapeake Corporation of Virginia

NORWAY:
Anth. B. Nilsen & Co.:
A/S Hurum Fabriker; *Bleached Sulphate*
A/S Katfos Fabriker, *Unbleached Sulphite*
A/S Krogstad Cellulosefabrik, *Bleached Sulphite*
A/S Tofte Cellulosefabrik, *Bleached Sulphite*
A/S Toten Cellulosefabrik, *Bleached Sulphite*
A/S Vestfos Cellulosefabrik, *Bleached Sulphite*
A/S Viul Tresliperi, *Dry Groundwood*

GERMANY:
Zellstofffabrik Waldhof, *"Beechopake" Hardwood Sulphite*

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Agents for:
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Spruce Falls Power & Paper Company Ltd., *Unbleached Sulphite*
The Onturio Paper Co., Ltd., *Unbleached Sulphite—Groundwood*
The Mohawk Corp. Ltd., *Groundwood*

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1960 will probably show another drop from those of 1959.

Exports from the United States moved up from 230,261 tons to 285,700 tons and this represents a solid gain that undoubtedly will be consolidated and pushed further in 1960. As pointed out earlier, this must be done if this industry is to prosper. The United States and Canada together had total exports of 389,500 tons, by far the biggest year ever in this part of the business.

Exports Will Increase

More and more as time goes on, the export of dissolving pulp will become increasingly important. Sales executives in this business are already widely experienced world travelers and ambassadors and in the future they will be hitting the most out-of-the-way places as the underdeveloped countries begin to rise from their lower standards of living. It is certain that people will wear clothes if they are available at a price that they can afford.

Of course, export sales are more costly and complicated than domestic sales. Distances are greater, consumers are smaller, payments are difficult, and because of varying and economic traditions are almost impossible to police. Credit information such as is available in the U.S.A. just doesn't exist anywhere else in the world.

In spite of all of the problems, the export of these pulps must increase to take up the slack that is expected to grow from the competition here between the rayon-acetate fibers and the non-cellulosics. If this does not happen, the booming Sixties, which all of us are expecting, will find the dissolving pulp industry out of step. It does not seem possible for the growth of the Fifties, which was more than double, to be repeated. For the last five years the American production has held relatively stable on a plateau varying between 950,000 and slightly over a million tons. A glance at the statistics in Table I makes this clear. These are taken from the sources of the USPPA.

Comment on Table II— Rate of Growth

One brief comment with respect to Table II—compare 1959 with 1955 and notice that although total production is higher, the net available tonnage for North American consumption is just about the same. And just one thing more; over the 10-year period from 1950 to 1959 the average annual growth has been 3.5% per year. It would be unwise to apply this same growth rate in production to the next 10 years but if it were done, there is enough capacity on hand right now to handle it. The average rate of growth in the exports has been about 15% per year. It seems reasonable that this rate will continue in spite of the new Sitka mill.

World Rayon-Acetate

The world production of rayon-acetate recovered handsomely in 1959 over the recession year of 1958, increasing from 2,462,500 tons to 2,750,000 tons as estimated by *Textile Organon* in February. Recovery was greatest in those countries which suffered most in the 1958 drop, Japan and Great Britain.

World capacity for the production of these fibers is estimated by the same source as being 3,647,000 tons in 1959 and 3,890,000 tons in 1960. Even in 1959, a year which came very close to the former peak year of 1957, there was considerable unused capacity in the world.

The United States production increased to 583,900 tons from 510,900 in 1958, a move of 14% versus the world increase of 10%. It is believed that this difference is due to the greater influence of the automobile business on American production than on the production of other countries. United States production in 1959 formed 21% of the world production.

Comment on Table III— Nylon Competition

These statistics in Table III seem to demonstrate that the production of these textile fibers is moving on a plateau that has existed for 10 years and the production over the next few years will undoubtedly stay in this same pattern depending to a great extent on the consumption of viscose tire cord This end use consumes about 60% of

TABLE II

NORTH AMERICAN PURIFIED WOODPULP
(Short tons)

Year	*Production*	*Imports*	*Exports*	*Net Available*
1947	707,000	23,700	56,000	674,700
1948	754,000	14,900	80,400	688,500
1949	620,930	4,550	83,150	542,330
1950	796,312	9,745	83,149	722,908
1951	1,014,240	4,152	151,029	867,363
1952	1,129,400	3,317	181,471	951,245
1953	1,132,338	1,549	214,658	919,229
1954	1,230,588	2,241	307,729	925,100
1955	1,400,950	508	341,080	1,060,378
1956	1,352,410	—	355,100	997,310
1957	1,362,400	—	376,890	985,510
1958	1,236,690	—	295,360	941,330
1959	1,451,620	—	389,500	1,062,120

Canada export fell from 102,220 in 1957 to 65,100 in 1958.
Source: U.S.P.P.A.

TABLE III

U. S. RAYON-ACETATE PRODUCTION BY TYPES
(Short Tons)

Year	*Viscose & Cuprammonium Filament*	*Acetate Filament*	*Viscose Staple & Tow*	*Acetate Staple & Tow*	*Total*
1949	272,150	127,500	64,900	32,350	496,900
1950	313,500	163,500	94,500	58,500	630,000
1951	329,050	150,050	103,650	64,350	647,100
1952	297,250	117,150	105,900	47,600	567,900
1953	328,800	114,650	109,550	45,450	598,450
1954	254,450	98,950	155,750	33,700	542,850
1955	317,500	115,050	168,900	28,900	630,350
1956	278,400	96,400	170,500	28,650	573,950
1957	253,200	103,950	185,600	28,150	570,900
1958	206,550	111,300	162,100	27,200	507,150
1959	254,050	119,800	179,550	35,500	583,900

Source: Textile Organon

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all filament viscose produced and there is no end use in sight that could come close to offsetting a serious loss in the tire cord field.

It became very evident that the competitive fiber, nylon, was seriously after a bigger share of the tire cord market late in 1959 when, just before Christmas, nylon prices were cut for the second time in 1959. The first cut, in August, amounted to 14 cents per pound and the second one, in December, was 9 cents per pound. The reduction in price occurring over a five-month period was $460.00 per ton and this alone is proof that the nylon producers intend to increase their share of this business.

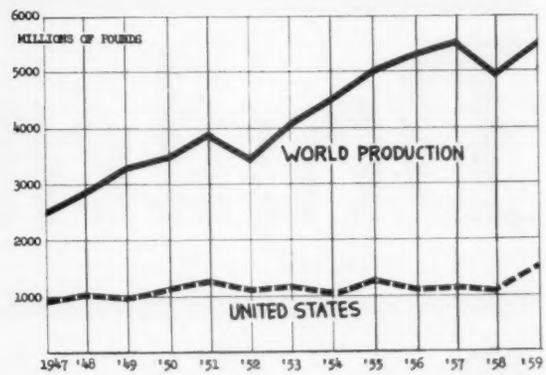
The struggle between nylon and viscose first began in 1947 and since then nylon's share of the market has grown each year. It is used in original equipment for truck tires, aircraft, and off-the-road machinery but so far it has not cracked the passenger car market on original equipment. In 1959 it worked up to a total of 62,500 tons of cord with rayon still holding 155,000 tons. Every ton of growth in nylon, though, is a loss for rayon.

The Big Battle of Fibers

This is a most interesting development as the fibers seem to be following the same road in their history. When rayon was new it was primarily a textile fiber, called artificial silk, and it found heavy use in lingerie, hosiery and dress materials. When nylon was new it went into the same fields and completely replaced rayon in hosiery and lingerie and then went searching for further uses in clothing where it eventually failed in most of them. When rayon was pushed out of the strictly textile usage it found a place in tire cord, carpeting and in industrial uses, such as belting and hose, while still holding some of the textile field through staple fiber which can be blended with almost any other fiber. Nylon is now forced into these same fields by such fibers as dacron, acrilon, orlon and others which can almost be tailor-made for specific requirements. Nylon still holds its place in hosiery, lingerie, uniforms, jackets.

Thus this battle for the tire cord market, which is big, could hold the future for both fibers as well as the future for dissolving pulp. Naturally the nylon price reductions were met by the viscose producers and this eventually reacted on the pulp price which had remained practically unchanged for eight years.

It was unheard of in a period of inflation that a raw material could remain static and it was undoubtedly the only one that did, but in the face of the fiber competition the prices broke down late in 1959 and the shake out continued until early 1960. As of the second quarter of 1960 the prices in effect were acetate grades $207 to $212; high tenacity $182½ to $185; staple fiber grades $175; cellophane $170. One producer has a special new staple fiber grade on test at $165. The competition here is vicious as the fiber struggle has competing producers of nylon, competing producers of viscose and competing producers of the raw material for viscose, and competing producers of the raw materials for nylon.



WORLD PRODUCTION of rayon and acetate recovers from dip of 1958.

TABLE IV

CELLULOSE CONSUMPTION IN RAYON ACETATE IN U. S.

Year	*Total Pulp*	*Woodpulp Consumed*	*%*	*Linters Pulp Consumed*	*%*
1930	63,850	45,000	62	27,000	38
1935	131,077	86,000	63	51,000	37
1940	235,585	178,000	75	60,000	25
1942	316,308	280,500	88	39,500	12
1944	361,977	285,000	78	82,000	22
1946	427,000	323,000	75	105,000	25
1947	478,000	397,000	83	81,000	17
1948	539,500	435,000	81	104,500	19
1949	476,600	348,700	73	127,900	27
1950	590,600	456,200	77	134,400	23
1951	616,300	515,500	84	100,800	16
1952	549,500	484,700	88	64,800	12
1953	589,100	522,000	89	67,100	11
1954	537,800	477,300	89	60,500	11
1955	634,500	546,900	86	87,600	14
1956	577,400	487,000	84	90,400	16
1957	566,000	517,000	91	49,000	9
1958	501,000	479,000	96	22,000	4
1959	579,000	550,000	95	29,000	5

Source: Textile Organon

Comment on Table IV— Linters vs. Wood

These statistics covering use of woodpulp and linter pulp in rayon acetate, cold figures on a sheet of paper, are somewhat like a history book in that they say very briefly and unemotionally what would require volumes to describe properly.

This is the story of an industry that has been forced to reorient itself almost entirely and through no fault of its own. For all practical purposes, cotton linters are being eliminated from textile rayon-acetate as an important raw material because it is based on a by-product of a farm product that has received so much government help that it is suffering in the same way that other government-aided products, such as corn, wheat and anything that a farmer can raise, has suffered.

There is meat here for a study on the effects of subsidies and their ramifications; the broad areas which these subsidies create for speculators to op-

B.C. Forest Service Photo

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Early in 1961, a new high quality market pulp mill will go on stream near Castlegar, British Columbia, at the foot of the Arrow Lakes region of the Columbia River. Celgar Limited will utilize almost 900,000 acres of prime northern-type forest lands held under a Tree Farm Licence in perpetuity.

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Celgar Kraft will combine many of the best qualities of Northern and Western pulps to produce a product with an exceptional balance of properties. The long, tough fibres from high-density softwoods develop high bursting strengths coupled with outstanding tear resistance over a wide range of freeness, and in a variety of stock preparation equipment.

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Celgar Kraft

erate in safely, with losses practically protected and profits nearly guaranteed. These circumstances operated to bring about price changes in cotton linter pulp, beyond the control of the processors, that reacted against the material. Over a period of years and years of this sort of thing and amplified by the continual improvements of woodpulps, unhindered by any government aid, a large area of end-use has been lost to cotton linters.

Cellophane Bounces Back

In the past several years, chemical cellulose, or just plain dissolving pulp as it is called here, has been discovered by other publications. In 1959 no less than five articles on the subject appeared in chemical and chemical news magazines. All this work has produced some better statistics than we have had before and they are welcomed by this writer who was alone in the field for nearly 15 years. More is known about cellophane now than in a very long time and more confidence can be placed in the figures.

This versatile film is showing surprising strength in the face of the multitude of materials which compete with it for protective or display wrapping. Next to paper, this cellulose product probably has the most intimate contact with the consumer. Every time a pack of cigarets or a cigar is opened, it is in cellophane. Even toilet paper is packed in it and paper envelopes, too. If it loses out in one field it seems to gain in another, or pick up a new one, for production in 1959 bounced up to 218,000 tons from 210,000 in 1958, and yet another 10,000 tons is expected to be added in 1960. As the big self-service markets with everything pre-priced, pre-wrapped and pre-cut grow and expand, the use of this film will follow.

Use and Disposition

In the table below an attempt has been made to break down the use and disposition of the production of these pulps, as reported for 1959.

TABLE V

PURIFIED WOODPULP END-USE PATTERN—1959

	Short Tons
Net available for North America	1,062,100
Consumed in Canada	56,300
In-transit shipments	20,400
Balance available for United States	985,400
Rayon-acetate textiles	550,000
Cellophane	225,000
Balance for other uses	210,400
Plastics including nitrocellulose and film	71,000
Miscellaneous viscose (sponge, caps, bands, sausage casings, seals)	13,400
CMC	10,000
Filters (industrial, cigaret, automotive)	47,500
Other derivatives	5,500
Plastic fillers and misc.	13,000
Vulcanized fiber and all other grades of paper	65,500

Directory of U.S. Rayon-Acetate Producers

Wood cellulose is a major raw material for all kinds of acetate and viscose fiber products. This list is compiled from Texile Organon, published by Texile Economics Bureau, Inc.

American Enka Corp. (rayon yarn, staple)
530 Fifth Ave., New York 36, N. Y.
Plants: Enka, N. C.
Lowland, Tenn.

American Viscose Corp. (rayon & acetate yarn & rayon staple & tow)
1617 Pennsyl. Blvd., Philadelphia 3, Pa.
Plants: Lewiston, Pa.
Meadville, Pa.
Front Royal, Va.
Nitro, W. Va.
Parkersburg, W. Va.

Beaunit Mills, Inc., American Bemberg and Coosa Pines Divisions (rayon yarn, staple & tow, cuprammonium)
261 Fifth Ave., New York 16, N. Y.
Plants: Childersburg, Ala.
Elizabethton, Tenn.

Celanese Fibers Co., Division of Celanese Corp. of America (rayon & acetate yarn, staple & tow)
180 Madison Ave., New York 16, N. Y.
Plants: Rome, Ga.
Cumberland (Amcelle), Md.
Rock Hill (Celriver), S. C.
Narorws (Celco), Va.

Courtaulds (Alabama) Inc. (rayon & other staple)
600 Fifth Ave., New York 20, N. Y.
Plant: LeMoyne, Mobile County, Ala.

E. I. du Pont de Nemours & Co., Inc., Textile Fibers Dept. (rayon & acetate yarn)
Wilmington 98, Del.
Plants: Old Hickory, Tenn.
Richmond (Ampthill), Va.
Waynesboro, Va.

Fair Haven Mills, Inc. (rayon monofilaments)
Plant: Fair Haven, Vt.

Hartford Fibres Co., Division of Bigelow-Sanford Carpet Co., Inc. (rayon staple)
140 Madison Ave., New York 16, N. Y.
Plant: Rocky Hill, Conn.

Industrial Rayon Corp. (rayon yarn & tow)
Union Commerce Bldg., Cleveland 1, O.
Plants: Cleveland, O.
Painesville, O.
Covington, Va.

Mohasco Industries, Inc., New Bedford Rayon Div. (rayon yarn)
P. O. Box 908, New Bedford, Mass.
Plant: New Bedford, Mass.

North American Rayon Corp., Subsidiary of Beaunit Mills, Inc. (rayon yarn, staple & tow)
261 Fifth Ave., New York 16, N. Y.
Plant: Elizabethton, Tenn.

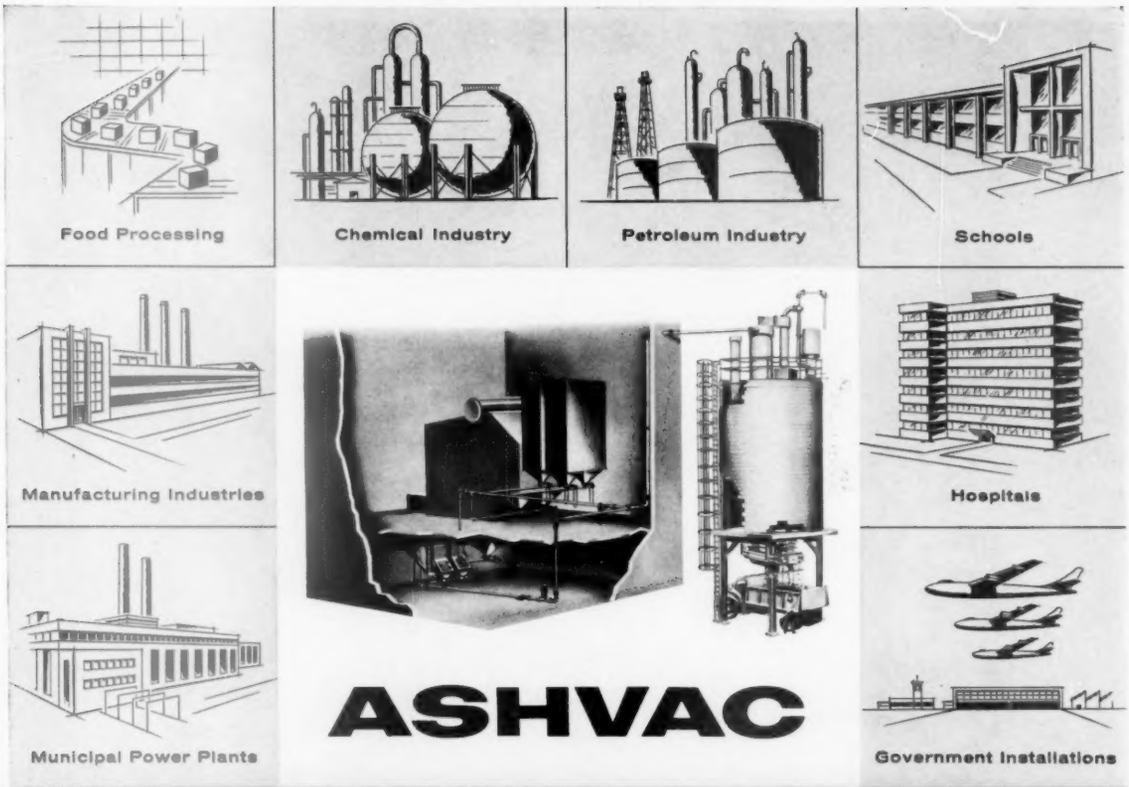
Skenandoa Rayon Corp., subsidiary of Beaunit Mill, Inc. (rayon yarn)
261 Fifth Ave., New York 16, N. Y.
Plant: Utica, N. Y.

Tennessee Eastman Co., Div. of Eastman Kodak Co. Marketer: Eastman Chemical Products Inc., Fibers Division (acetate yarn, tow & solution dyed staple)
Kingsport, Tenn.
Plant: Kingsport, Tenn.

Scan the passenger lists of flights all over the world and very often you'll find a Rayonier representative on his way to help one of our customers derive the maximum benefits inherent in every Rayonier wood pulp. To protect your product, growth and profits, shouldn't you be on his itinerary?

RAYONIER
NATURAL RESOURCES CHEMISTRY

Rayonier Incorporated
General & Executive Offices
161 East 42 Street, New York



Removes Boiler Ash* THROUGHOUT INDUSTRY

The use of ASHVAC (The Allen-Sherman-Hoff Co.'s trade name for their small, steam-jet pneumatic ash removal systems) cuts horizontally across *all* industry. ASHVAC Systems are installed in the central steam plants of schools and colleges . . . textile mills . . . food processing plants . . . municipal power plants . . . hospitals . . . petroleum refineries . . . chemical processing plants . . . all types of governmental installations . . . all kinds of manufacturing plants. ASHVAC finds application in the small and medium size steam generating plants anywhere coal is burned.

Three good reasons why power engineers *specify* ASHVAC Systems:

ASHVAC is PROJECT ENGINEERED—There is no "package" system for all applications. Each job is different; ASHVAC uses standard components in a system engineered to the job's specific requirements.

ASHVAC is PRICED RIGHT—Years of experience have enabled us to standardize many components, reducing manufacturing costs. A-S-H operates its own manufacturing plant—another cost saving advantage passed on to our customers.

ASHVAC is BACKED BY EXPERIENCE—The Allen-Sherman-Hoff Company has pioneered in the solution of ash handling problems. Behind every job is 37 years of experience—giving you the best, cleanest and cheapest system to operate.

**A-S-H service doesn't stop with installation. When service problems come up, we stand ready to give prompt service assistance. This is a policy worth considering when suppliers are being selected.*

MATERIALS HANDLING SYSTEMS

the **Allen-Sherman-Hoff** company

247 E. Lancaster Ave., Wynnewood, Pa.

Offices and representatives in principal cities

"Man O'man... relaxation during leisure hours takes on a new meaning since we began using more WISCONSIN WIRES at the mill"
WISCONSIN WIRE WORKS
APPLETON · WISCONSIN

How Du Pont brighter pulp...save

Mechanical pulp bleaching...

A combination of peroxides can save up to $1.25 a ton over a hydrogen peroxide treatment.

Over 95% of all groundwood bleacheries have found that a combination of hydrogen and sodium peroxides cuts bleaching costs up to $1.25 a ton. The reason—combination formulas eliminate the use of caustic soda.

How is this possible? Because of the bleaching chemistry involved. When hydrogen peroxide is used alone, substantial quantities of caustic soda must be added to assure effective bleaching. But when sodium peroxide is part of the formula, caustic soda is formed and additional quantities aren't needed. When caustic limits of this solution are reached, hydrogen peroxide is added to complete the balance and the bleaching formula is now ready to use.

The charts below show the savings possible in a one-stage tower bleaching process when a combination of peroxides is used instead of a single hydrogen peroxide: For normal brightness, the saving runs from $.90 to $1.00 a ton; for premium brightness, $1.15 to $1.25 a ton.

You can obtain cold soda pulp and groundwood pulp brightness as high as 75 by this method. Cold soda pulp can be bleached in the refiner in absence of a bleaching tower with brightness gains up to 20 points.

For further information, get in touch with your Du Pont Representative listed at right.

EXAMPLE #1

ONE-STAGE TOWER PROCESS FOR NORMAL BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.2% "Solozone" sodium peroxide
0.7% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.2% NaOH
1.7% "Albone" 50 hydrogen peroxide

SAVINGS OF $.90 TO $1.00 PER TON BY USING COMBINATION OF PEROXIDES

EXAMPLE #2

ONE-STAGE TOWER PROCESS FOR PREMIUM BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.5% "Solozone" sodium peroxide
1.25% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.5% NaOH
2.5% "Albone" 50 hydrogen peroxide

SAVINGS OF $1.15 TO $1.25 PER TON BY USING COMBINATION OF PEROXIDES

Peroxides give you you up to $1.25 a ton!

Chemical pulp bleaching...

Peroxides—alone or in combination —give brightness up to 92 with excellent stability.

Mills throughout the country are finding that peroxides, alone or in combination, can give chemical pulp high brightness stability—without significant decrease in pulp strength or yield.

IN KRAFT BLEACHING, a five-stage process is producing outstanding results for a number of mills, among them a southern papermaker now producing over 100,000 tons of high brightness pulp annually. This process combines the best advantages of three bleaching agents—hypochlorite, chlorine dioxide and peroxide—to give brightnesses up to 90 with excellent brightness stability.

IN SULFITE BLEACHING, three peroxide processes are proving successful—a single-stage peroxide process which brightens pulp up to 75; a two-stage hypochlorite-peroxide process which brightens up to 86; a four-stage chlorine-caustic-hypochlorite-peroxide process which brightens up to 92. For information, call your Du Pont Representative listed below.

TECHNICAL SERVICE FOR YOU . . . Peroxides have a powerful bleaching action that produces high brightness pulp with excellent brightness stability. But it takes skill and experience to use peroxides efficiently. With Du Pont "Albone" hydrogen peroxide and "Solozone" sodium peroxide, you get the most authoritative advice and service available . . . from the manufacturer of *both* products.

Du Pont specialists can give you practical bleaching formulas for groundwood, cold soda, kraft and sulfite. They'll help you set up your bleaching operation, train operators, and check frequently to make sure your bleaching quality stays high and costs stay low.

Call your Du Pont representative listed below; he'll be glad to start a program to help you determine the advantages of Du Pont peroxides in your mill. Or write: Du Pont, Electrochemicals Department, Peroxygen Products Division, Wilmington 98, Delaware.

MIDWEST AREA
W. L. Liike, Chicago, Ill. • INdependence 3-7250

WEST COAST AREA
P. E. Kiefer, Portland, Oregon • CApitol 7-1281

NEW YORK & BOSTON AREA
C. R. Lombard, NewYork, N.Y. • LOngacre 3-6440

SOUTHERN AREA
R.W. Hammond, Charlotte, N.C. • FRanklin 5-5561

Or call: N. J. Stalter, Wilmington, Del. • PRospect 4-4698

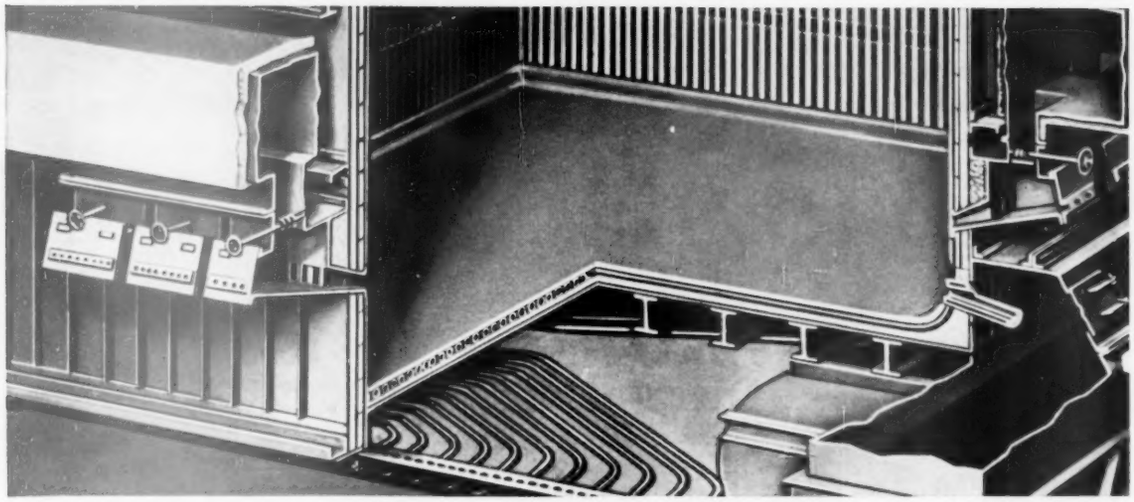
DU PONT PEROXIDES

ALBONE® hydrogen peroxide

DU PONT REG. U.S. PAT. OFF.

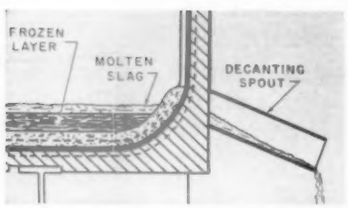
SOLOZONE® sodium peroxide

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

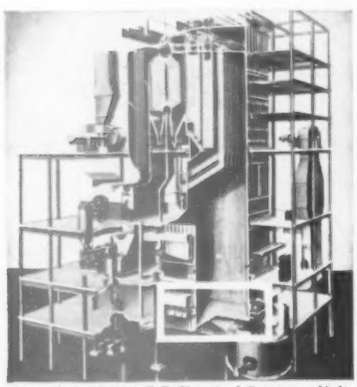


Cutaway view of the C-E hearth showing watercooled floor and decanting spout.

Watercooled Decanting Hearths Score 157 Maintenance-Free Years



Molten slag never touches furnace floor, preventing damage to hearth and contamination of slag by eroded refractory.



One of the latest C-E Chemical Recovery Units — an important part of the modern kraft pulp process. Note that slag from waterscreen and superheater can fall directly to hearth.

. . . in 50 C-E recovery units

Since the development of the watercooled decanting hearth by Combustion Engineering in 1951, 50 C-E Chemical Recovery Units have served an aggregate of 157 years *completely free from hearth maintenance.*

The decanting principle — key to this durability — employs a *level,* watercooled furnace floor. A layer of solidified slag, kept frozen by the watercooling, covers the floor. Molten slag resting on this hardened surface drains off (decants) through a spout located several inches above the frozen layer. Hearth refractory and floor tubes are never exposed to erosion by the hot liquid slag, hence rarely need repair.

The C-E Decanting Hearth eliminates a common cause of furnace shutdowns. Other C-E advances offer improved recovery unit control, flexibility and efficiency. And, because of the high availability experienced with modern C-E recovery units, pulp mills can now depend on one large-capacity unit in place of two smaller ones — with considerable savings in the cost of maintenance and operation. For interesting details, call the C-E office nearest you or contact the C-E Paper Mill Division in New York.

COMBUSTION ENGINEERING C-E C-269

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

CANADA: Combustion Engineering-Superheater Ltd.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

The toughest clothing ever made for

KRAFT MACHINES

NEW RESISTEX® FELTS

New Resistex felts embody the most advanced design techniques with the best of chemical treatments. Engineered for Kraft machines, exclusively by Huyck, these felts provide . . .

GREATER RESISTANCE TO
WEAR • STRETCHING • PLUGGING
CHEMICAL AND MILDEW DAMAGE
SHELL MARKING • EDGE FAILURE

Beyond this, Resistex felts are equally noted for efficient water removal and good finish properties.

A leading mill scored a new record, running Kraft, with Resistex felts on the 1st and 2nd press positions of its machine, at speeds up to 1,800 f.p.m. for 48.3 and 38.5 days respectively. Felts were removed for a change in grade with life remaining.

Your Huyck Sales and Field Service Engineers will be glad to show you how Resistex felts can help you produce more and better Kraft at lower felt cost per ton.

HUYCK FELTS

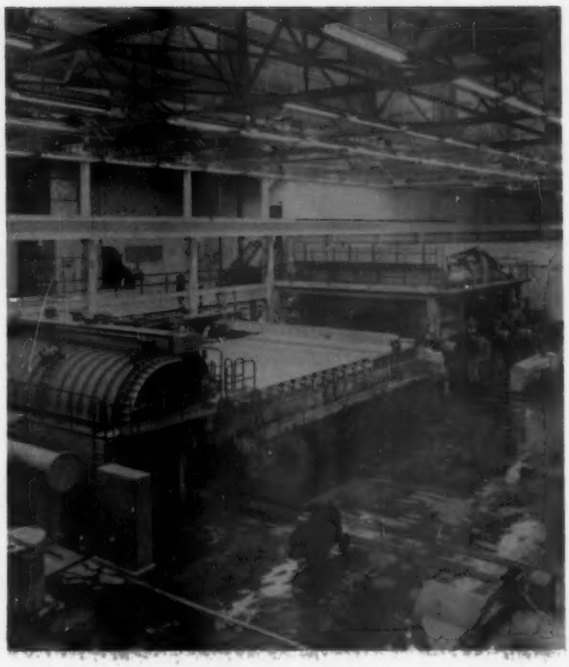
Huyck Felt Co.,
Rensselaer, N. Y.;
Alicevile, Ala.;
Division of Huyck Corporation.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.

NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

The toughest clothing
ever made for

NEWSPRINT MACHINES



NEW RESISTEX® FELTS

Engineered for newsprint machines, exclusively by Huyck — new Resistex felts incorporate the most advanced design techniques with the best of chemical treatments. Result: an entirely new type of felt that has . . .

GREATER RESISTANCE TO
WEAR • STRETCHING • PLUGGING
CHEMICAL AND MILDEW DAMAGE
SHELL MARKING • EDGE FAILURE

In addition, Resistex felts provide for efficient water removal and good finish properties.

One present user scored a new record, running newsprint on a Resistex suction transfer felt at speeds over 2,000 f.p.m. for 29 days; others, including those using felts woven endless, report more tons of paper per pound of felt than previously achieved.

Your Huyck Sales and Field Service Engineers, who share your interest in producing more and better newsprint, will be glad to show how Resistex felts can benefit you.

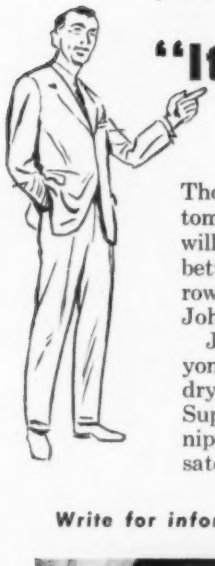
HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
Division of Huyck Corporation.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.

NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

New Paper Machine? Here's a tip from the field:



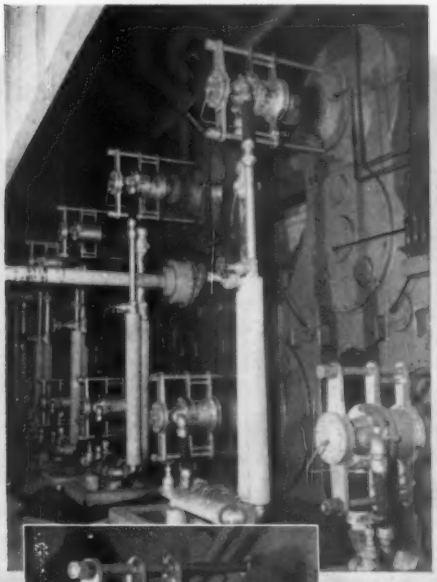
"It's not really new without JOHNSON JOINTS"

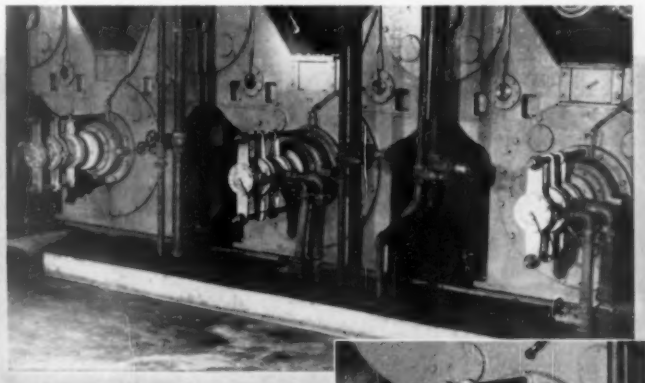
Those aren't our words; one of our customer-friends said it. But this much we will say: Any new paper machine will be better able to meet today's—and tomorrow's—demands if it is equipped with Johnson Rotary Pressure Joints.

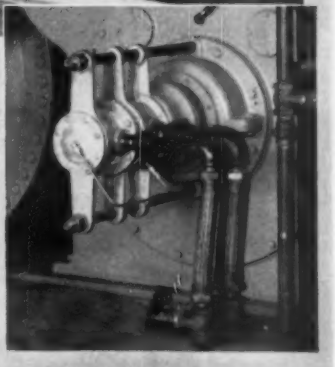
Johnson engineering has gone far beyond the simple task of getting steam into dryer rolls. Developments like the new Super construction, the "Quick Release" nipple and the Automatic Load Compensator have blazed a trail toward higher operating speeds and pressures. Research with the new Johnson Rotary Syphon places us now on the threshold of a major breakthrough in roll drainage.

Johnson Joints are available for all paper machines—rotating or stationary syphon pipes, open or enclosed gearing. All machinery manufacturers can supply them. We'll supply a pair for 90-day trial in your own mill, so you can get all the facts first hand.

Write for information on Johnson Joints—most advanced and most complete line of its kind







These two are really NEW

Pictures show Johnson Joints on two outstanding paper machines built by Black-Clawson Company, Paper Machine Division. There are 64 Johnson Joints on one, 69 on the other. These are Type L-N Joints, for rotating syphon pipe application. The simple method of mounting employs support rods which carry all the weight of joint and piping, permit the rotating assembly to "float" freely inside. Installations include Automatic Load Compensators, a device which utilizes pressure from within the joint to create a never-varying unloading pressure at the sealing surface, thus cutting power demand and wear to a minimum.

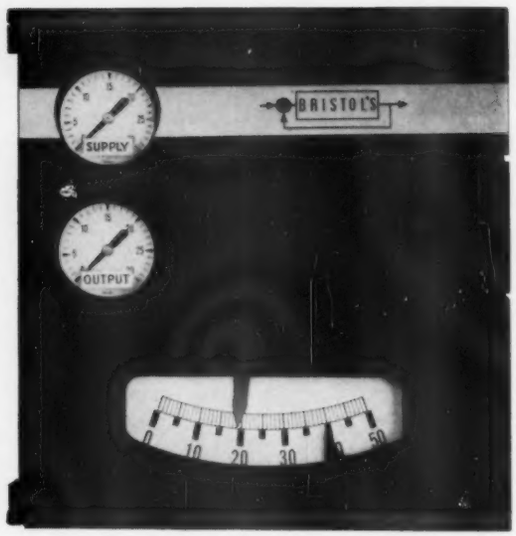
THE JOHNSON CORPORATION

849 Wood Street, Three Rivers, Michigan

Rotary Pressure Joints • Direct Operated Solenoid Valves

NEW

BRISTOL'S



Series 624 A/D* pneumatic controller features simplicity and high control stability

- **Simple modular design for ease of servicing**
- **High control stability for closer process control**
- **Designed for batch-type and continuous processes**
- **Proportional and proportional-plus-reset control models available**

Top control performance with maximum simplicity plus standard Bristol precision measuring elements—those are the key features of the Bristol Series 624 Controller. The 624 uses the same renowned elements that have earned such a reputation for accuracy and dependability on other Bristol automatic controlling and recording instruments—perfected through wide experience and many years of development.

Self-contained modular design of the control unit speeds servicing. The whole modular unit, consisting of an aluminum casting with working parts made of stainless steel, Ni-Span C, and Neoprene diaphragms, can be removed by taking out only two screws and a link.

Outstandingly compact, the aluminum instrument case (only 8" x 8" x 5" overall) is completely weatherproof. It is designed for either flush, surface, panel, or valve mounting. Attachments for pipe mounting (2-inch pipe) are available. Write for complete data on the versatile and economical 624 A/D. The Bristol Company, 142 Bristol Road, Waterbury 20, Conn. 0.35

Advanced Design

CONTROLLERS OFFERED FOR:

PRESSURE AND VACUUM: Ranges from full vacuum to 10,000 psi.

TEMPERATURE: Ranges from −100°F to +1000°F.

FLOW AND DIFFERENTIAL PRESSURE: With mercury-type manometer and dry-type differential unit.

LIQUID LEVEL: With bulb unit and mercury manometer and dry-type differential unit.

HUMIDITY: Zero to 100% relative humidity.

CONTROL UNIT CHARACTERISTICS:

PROPORTIONAL BAND: 0-400% continuously adjustable, direct- or reverse-acting.

RESET: 0.1 to 50 repeats per minute.

AIR PILOT: Non-bleed type.

PILOT CAPACITY: 4.0 scfm.

FREQUENCY RESPONSE: Flat to 400 cycles per minute.

TEMPERATURE STABILITY: Less than 0.1% change in the output pressure for 90°F temperature change.

MATERIAL: Aluminum housing; 316 stainless steel internal parts; Ni-Span C feedback element.

BRISTOL... for improved production through measurement and control

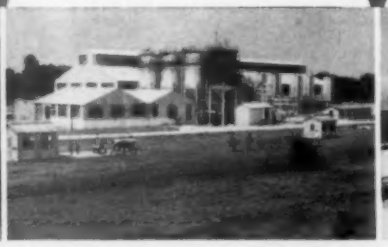
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

SULPHUR

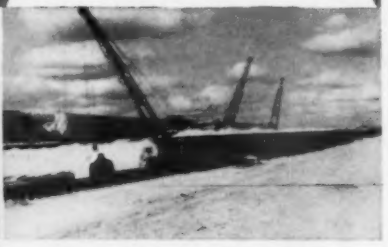
6 POINTS OF DEPARTURE

FANNETT, TEXAS

MOSS BLUFF, TEXAS



NEWGULF, TEXAS



SPINDLETOP, TEXAS

WORLAND, WYOMING

OKOTOKS, ALBERTA

Solid or Molten Sulphur to all users in the United States and Canada

In addition to these six producing properties, stocking and distribution centers are being set up, thus broadening the TGS Service to industry. Ample supplies of both molten and solid sulphur will be available at these centers. Cincinnati, the first of these units, is now in full operation.

TEXAS GULF SULPHUR COMPANY

75 East 45th St., New York 17, N. Y.
811 Rusk Ave., Houston 2, Texas

Sulphur Producing Units: Newgulf, Texas • Spindletop, Texas • Moss Bluff, Texas • Fannett, Texas • Worland, Wyoming • Okotoks, Alberta, Canada

The WINNAH...and **CHAMPION** *as always*

The unchallenged reputation of Norton pulpstones for being able to "stand up and take it" — to stay in profitable production year after year — is supported by cold, hard facts.

Statistics show that since 1926, when Norton produced the first successful pulpstone, many of the thousands of Norton pulpstones used by paper mills in all parts of the world have had an average productive life of more than 30,720 hours. Most have produced an average of more than $5,000,000 worth of pulp. That's championship performance in any language!

Today, as in the past, each Norton pulpstone is carefully engineered to meet the special requirements of each individual mill. To get championship pulpstone performance in *your* mill, consult the Norton pulpstone engineer in your territory. He is qualified by experience to study your mill and to recommend just the right Norton pulpstone for your type of wood, your type of grinder and the type of pulp you want to produce.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada Ltd., Hamilton, Ont.
EXPORT: Norton International Inc., Worcester 6, Mass.

NORTON PULPSTONES *the world's standard for mechanical pulp*

75 years of . . . Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

FABRICATION AND ERECTION...
Vessels by American Pipe & Construction Co.

Performance and dependability of facilities are vital in the highly competitive paper industry. That's why there's special significance in the fact that the Longview Fibre Company, one of the outstanding mills in the industry, has selected American Pipe and Construction Co. as one of its sources for steel fabricated units. ■ American's experience of 35 years serving the Northwest as designers, fabricators and erectors of quality steel plate installations is available for your needs.

Partial list for Longview Fibre Co.

Digesters	Salt Cake Silos	Green Liquor Clarifiers
Blow Tanks	Dissolving Tanks and Vent Stacks	Green Liquor Storage Tanks
Accumulators	Recovery Boiler Stacks and Ducts	Foam Tanks
Hypo Towers	Chip Silos	Jet Condensers
Dryer Rolls	High Density Storage Tanks	Filtrate Tanks
Hydrapulper Hoppers	Chlorinator Towers	Alum Storage Tanks
Stock Chests	Lime Mud Storage Tanks	Caustic Soda Tanks
Lime Storage Silos		White Liquor Storage Tanks
Oil Storage Reservoirs		Causticizer Tanks

American PIPE AND CONSTRUCTION CO.

Northwest Division

518 N.E. Columbia Blvd. • Portland 11, Oregon

Portland: BUtler 5-2531 • **Seattle:** ADams 2-1336

THIELE KAOLIN

water-washed, spray-dried COATING CLAYS

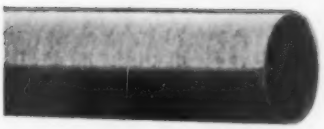
- **Controlled Particle Size** • **Excellent Color**
- **Standardized Low Viscosity** • **High Brightness**

Thiele Water-Washed Clays are mined from vast holdings in the heart of Georgia's clay belt, carefully tested and controlled while being processed at Thiele's modern plant. Two spray drying plants assure coating clays that will provide EASIER MAKE-DOWN—IMPROVED HANDLING—LOWER MOISTURE CONTENT—MORE UNIFORMITY.

Write for full information.

Thiele Kaolin Company

P. O. BOX 270 • SANDERSVILLE, GA.



STRONG as steel pipe

. . . at one-eighth the weight!

Circumferential Tensile Strength . . . 80,000 psi

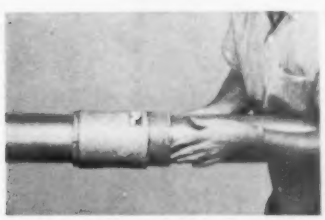
BONDSTRAND®

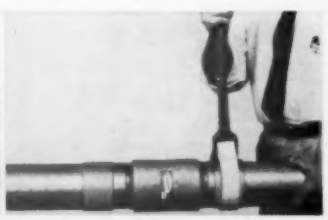
the revolutionary fiber glass reinforced epoxy pipe for corrosive service

114

Here's a pipe that holds up indefinitely under the corrosive action of many salt, acid and alkaline solutions . . . that can't contaminate or flavor the piped material . . . that is rigid enough to resist sag, cold flow or deformation – flexible enough to follow normal ditch contours . . . that remains smooth and unclogged throughout its entire service life . . . that won't leak, even near its burst pressure.

Easy to install, with choice of locking wedge or threaded fittings.





Simple instructions with each shipment insure a perfect joint on the first try.

IN THE PAPER INDUSTRY...

The resistance of BONDSTRAND pipe to chemical solutions and wet environments make it well suited to pulp and paper operations, including the transportation of pulp, stock, water, wastes and dyes. Tests are recommended for liquor applications.

Amercoat® CORPORATION

Dept. FG • 4809 Firestone Boulevard • South Gate, California

921 Pitner Ave. Evanston, Ill. | 360 Carnegie Ave. Kenilworth, N.J. | 2404 Dennis St. Jacksonville, Fla. | 6530 Supply Row Houston, Tex. | 111 Colgate Buffalo, N.Y.

Engineered AIR SYSTEMS *for Pulp and Paper Processing*

Ross does many things with air. They build equipment to heat it for drying paper, pressurize it for moving chips through a conveyor or dehydrate it to squeeze out moisture. Ross makes equipment for almost every job in the paper making process. And in each of these jobs Ross harnesses the air to the most exacting requirements so that paper is produced in a manner that is efficient, inexpensive and with maximum comfort for plant personnel. The proper control of air is vital and, since no two paper mills are alike in design, neither are any two air systems similar. Consequently, Ross must specially engineer each air system to the mill that uses it.

BARKER
Heating and ventilating systems for the barker room.

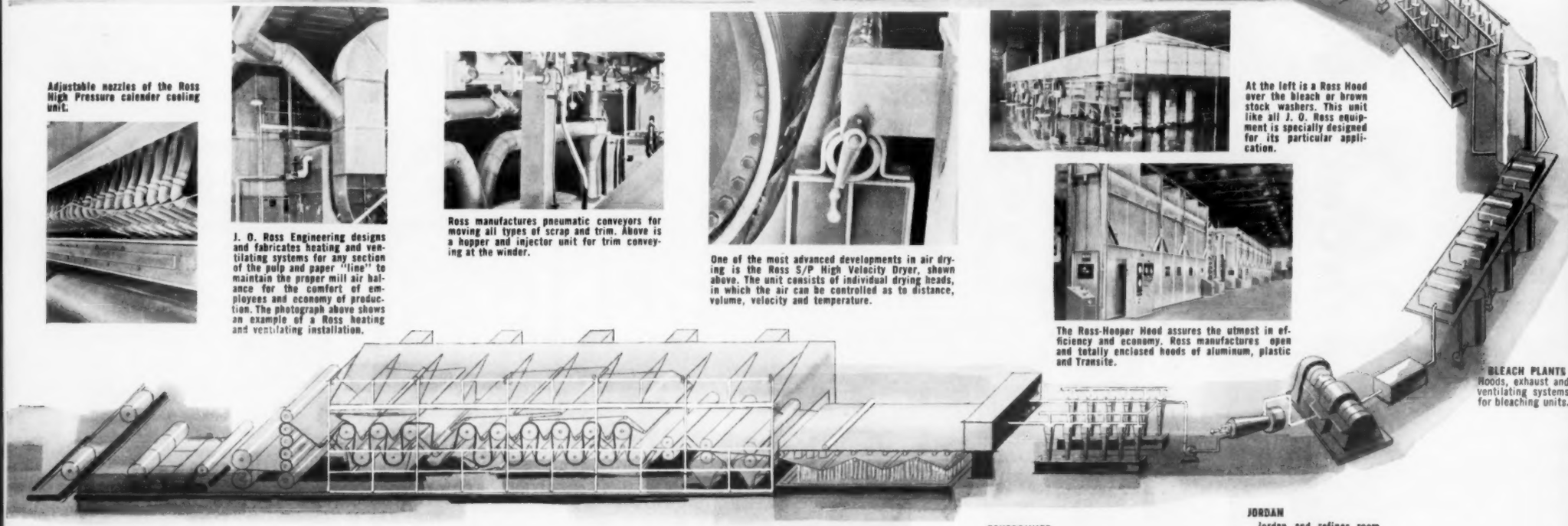
CHIPPER
Pneumatic dust conveyors. Heating and ventilating systems.

DIGESTER
Digester exhaust and comfort ventilating systems.

BLOW TANK
Waste heat recovery.

WASHER
Ross Washer Hoods, exhaust and ventilating systems.

SCREEN
Flat or roll screen exhaust and ventilating systems.



Adjustable nozzles of the Ross High Pressure calender cooling unit.

J. O. Ross Engineering designs and fabricates heating and ventilating systems for any section of the pulp and paper "line" to maintain the proper mill air balance for the comfort of employees and economy of production. The photograph above shows an example of a Ross heating and ventilating installation.

Ross manufactures pneumatic conveyors for moving all types of scrap and trim. Above is a hopper and injector unit for trim conveying at the winder.

One of the most advanced developments in air drying is the Ross S/P High Velocity Dryer, shown above. The unit consists of individual drying heads, in which the air can be controlled as to distance, volume, velocity and temperature.

At the left is a Ross Hood over the bleach or brown stock washers. This unit like all J. O. Ross equipment is specially designed for its particular application.

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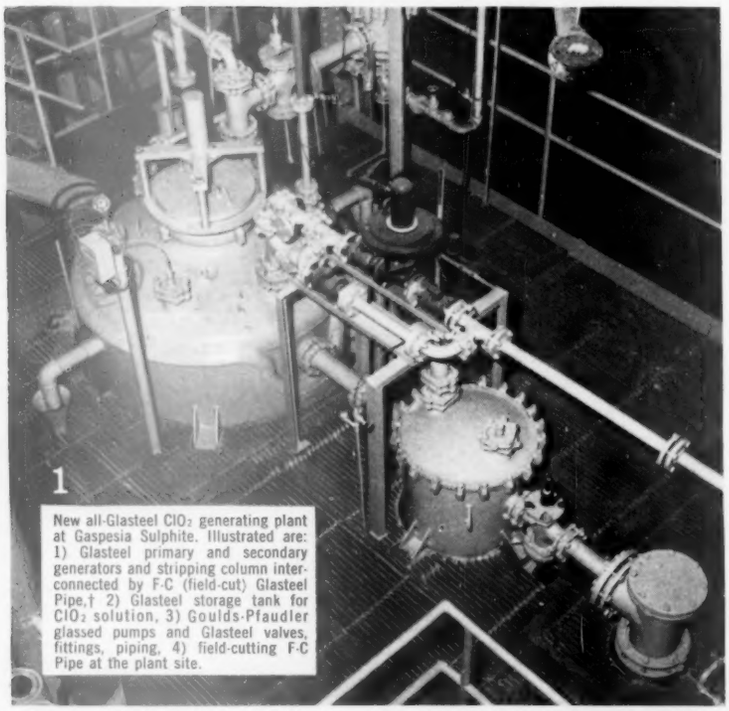
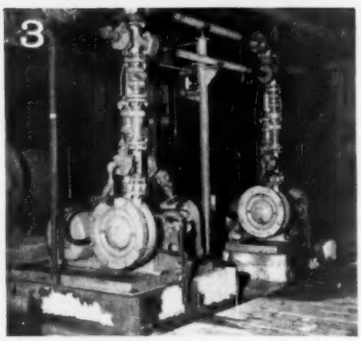
FLUIDICS* AT WORK



1

New all-Glasteel ClO_2 generating plant at Gaspesia Sulphite. Illustrated are: 1) Glasteel primary and secondary generators and stripping column interconnected by F-C (field-cut) Glasteel Pipe,† 2) Glasteel storage tank for ClO_2 solution, 3) Goulds-Pfaudler glassed pumps and Glasteel valves, fittings, piping, 4) field-cutting F-C Pipe at the plant site.

2



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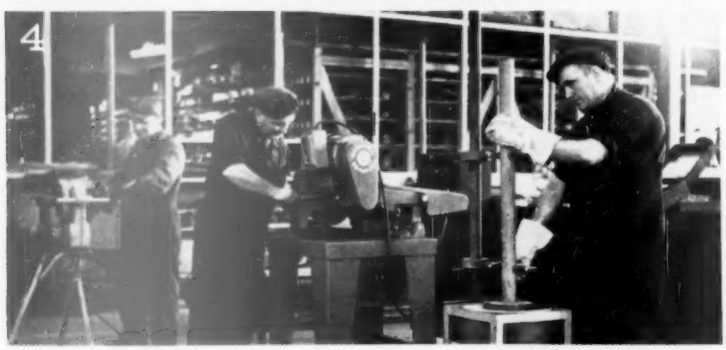

4

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*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

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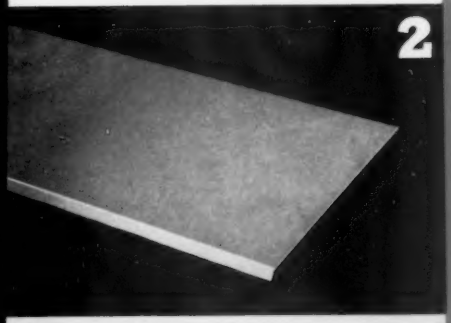

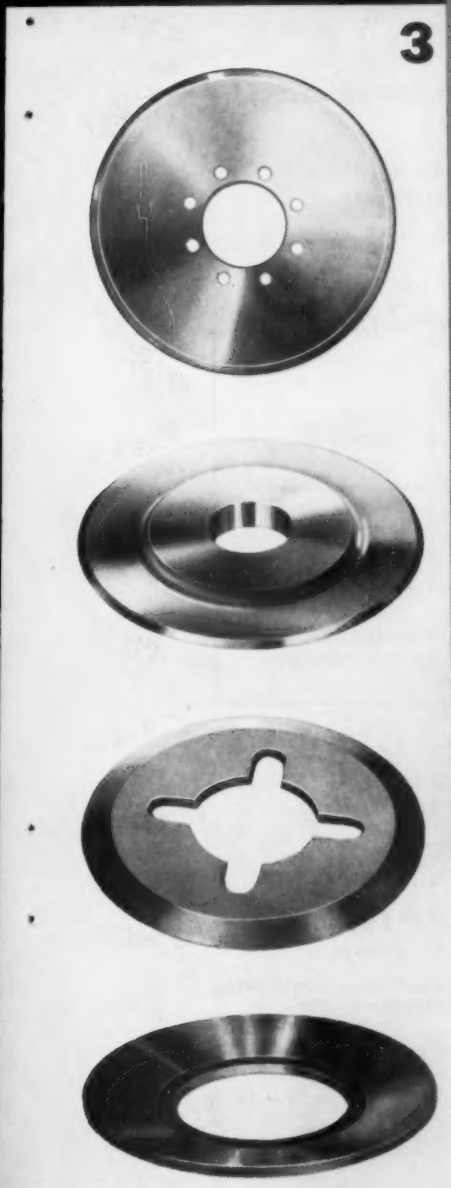

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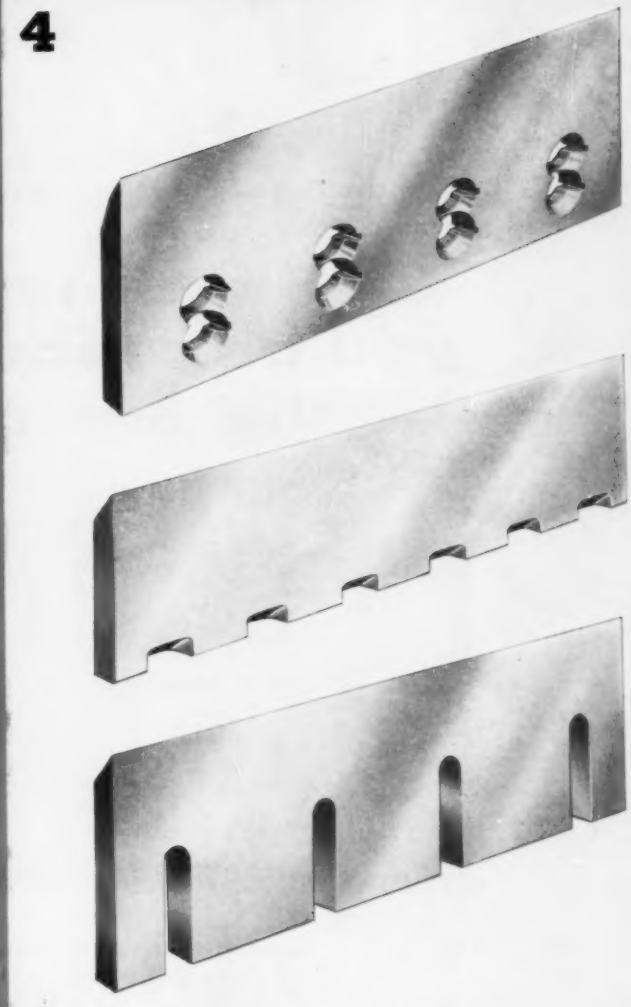

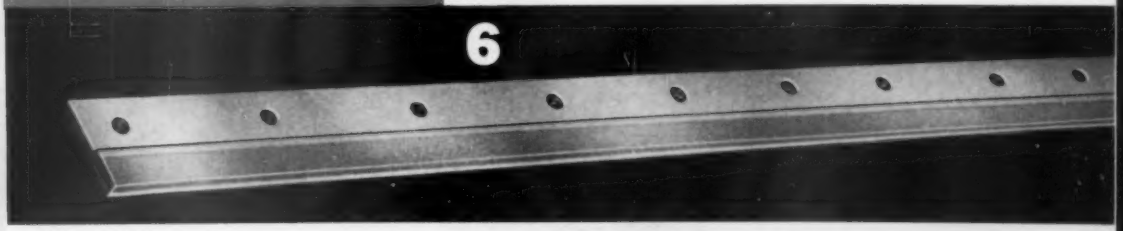

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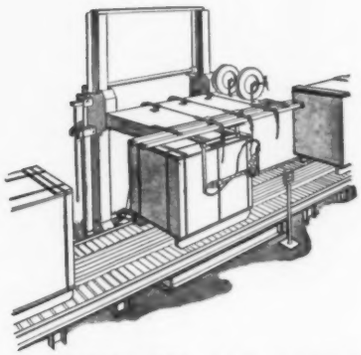

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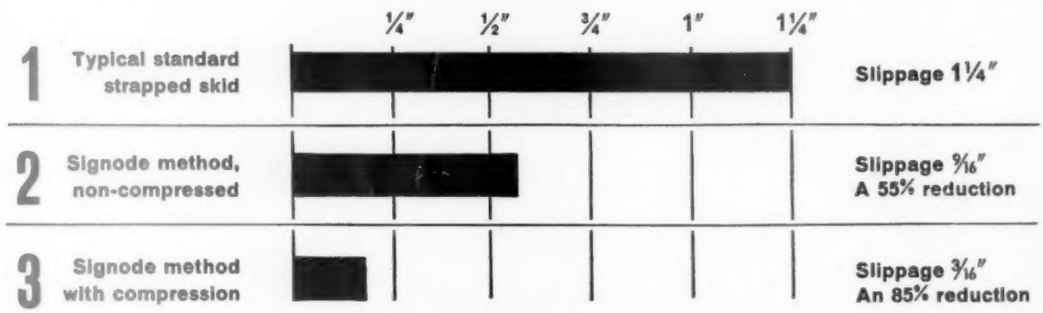
Signode engineers ran accelerated impact tests on an impact machine, comparing typical standard strapped paper skids with skids strapped the Signode way without compression and skids strapped the Signode way with compression. Here are the results.

PAPER SLIPPAGE, STRAPPED PAPER SKIDS, AFTER 5 IMPACTS



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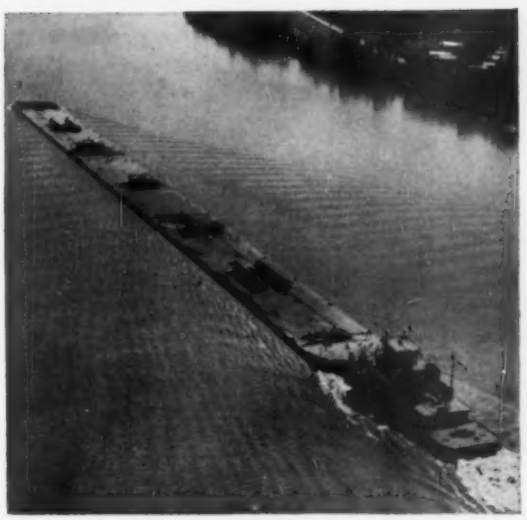

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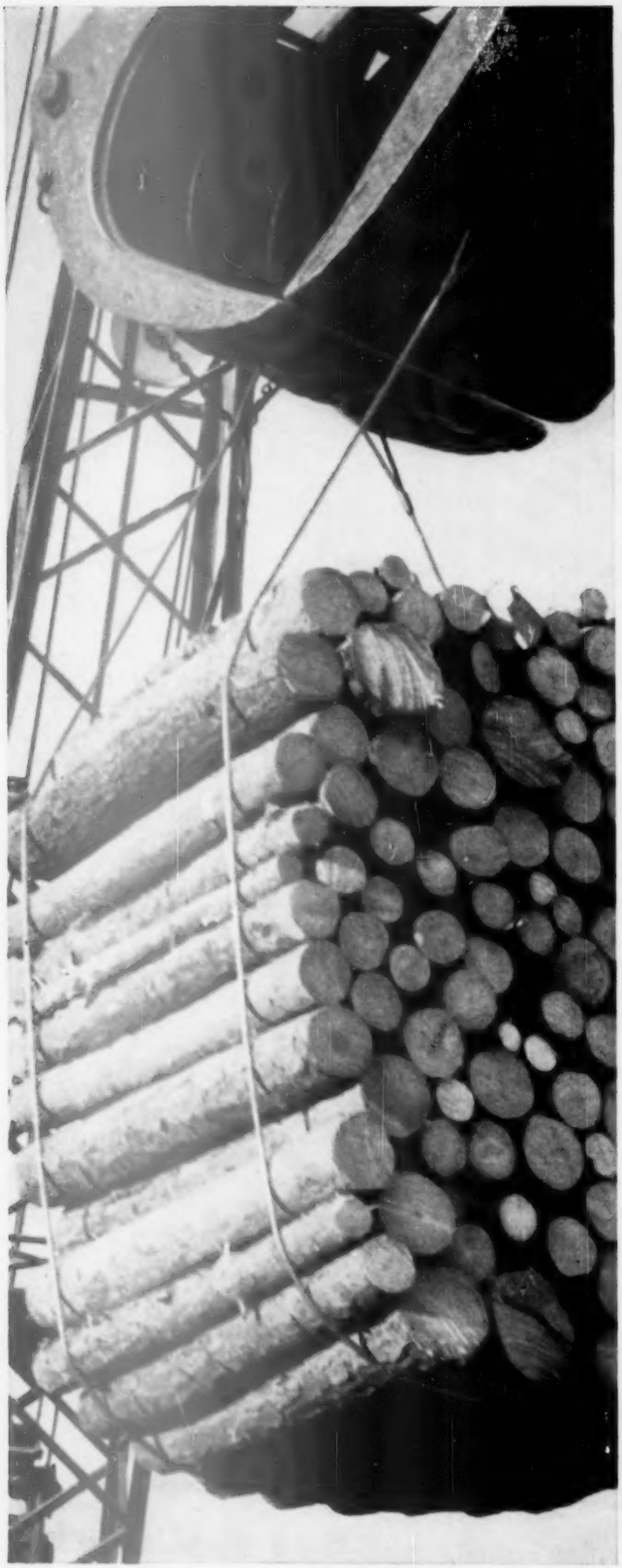

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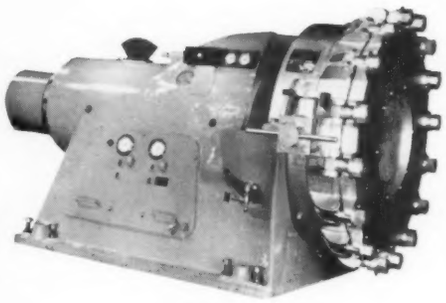
American Defibrator Continuous Digesters with Screw Feeders or Rotary Feeders and Asplund Defibrators produce pulp at substantial savings in production cost. The capacity of the Defibrator Continuous Digesters ranges from 50 to 250 tons of pulp per day or more. Various raw materials may be used, such as softwood, hardwood, cotton linters or bagasse.

Non-chemical high yield pulps produced by the Asplund Defibrator are used for the manufacture of hardboard, insulating board and roofing felt. Semi-chemical pulps for corrugating medium as well as bleachable grades and pulp for newsprint furnish are also produced by the Defibrator Continuous Digester.

The large size Type D-42 Defibrator is now available and has been developed to meet the current trend in the Pulp and Paper Industry towards larger production units. This Defibrator is driven by an electric motor directly connected to the main shaft by a gear coupling. The grinding pressure is hydraulically controlled and easily adjusted. Therefore uniform, high quality pulp is produced and D-42 units now in operation indicate capacity of about 100 tons/day of non-chemical and 200 or more tons/day of semi-chemical pulp.



TYPE D-42 Defibrator

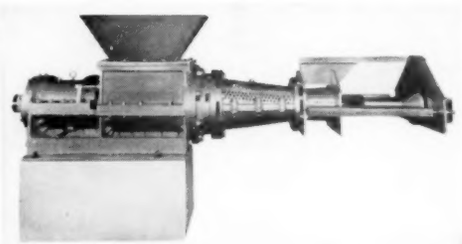
ASPHALT DISPERSION PROCESS

The Asplund Defibrator for treatment of waste paper stock in the "A-D" system has found an extensive application in the Paper Board Industry in order to disperse asphalt, waxes and similar materials in the waste paper. As a result, a clean and sterile sheet is made on the paper machine at considerable savings, since less expensive waste paper can be utilized. Processing costs for steam, power, labor and maintenance are low. No chemicals are required. Total annual capacity installed now exceeds 1½ million tons of waste paper. Inquiries receive prompt attention.

Continuous Dewatering

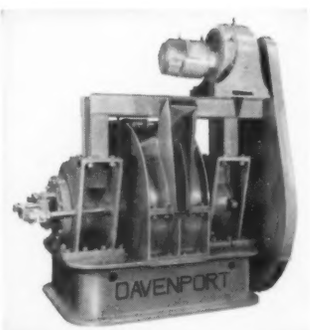
THE DEFIBRATOR BARK PRESS

The Defibrator Bark Press was developed for continuous dewatering of bark for use as fuel. Processing capacity is about 4 to 5 tons per hour, bone-dry basis. The power consumption at this rate runs between 60 and 75 H.P. The continuous operation reduces labor and maintenance costs to a minimum.



THE DAVENPORT DEWATERING PRESS

The Davenport Continuous Press extracts water from fibrous materials, such as various grades of waste paper stock, kraft, sulphite or groundwood pulp. The Model 1B Press has a capacity of about 75 tons/24 hours of pulp, bone-dry basis, dewatering the stock from about 10% consistency to about 35% consistency or higher. The wet pulp entering the press is squeezed and dewatered as it passes through the press and the squeezed out water escapes through the screen plates and drains off at the bottom of the press. There are practically no fiber losses. The pulp is handled very gently by the press which operates at low speed. Therefore, no "fish eyes" are formed in the pulp during the dewatering. The Davenport Press operates very efficiently with low power consumption, high capacity and low maintenance cost. Inquiries receive prompt attention.



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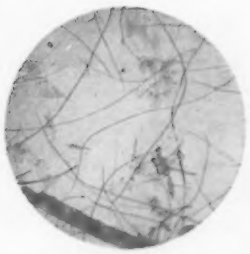
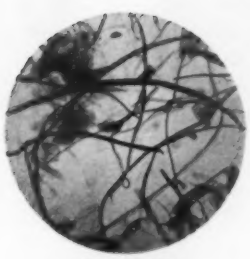


RICE STRAW

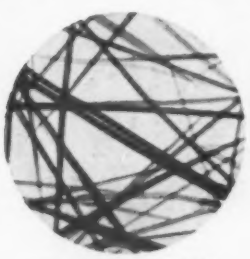
REEDS
(phragmites communis)

ELEPHANT GRASS
(before cleaning)

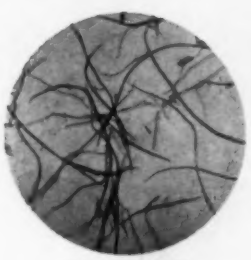
We build pulp and paper mills



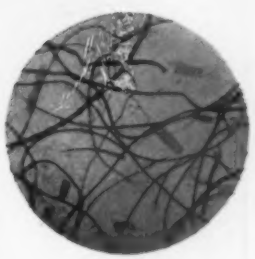
CORN STALK
(before depithing)



SUGAR CANE BAGASSE
(completely depithed)



ESPARTO GRASS



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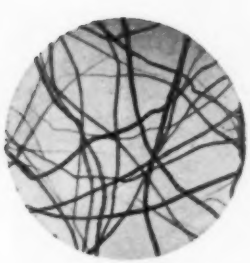
around the world

magnification:
approx. 35x



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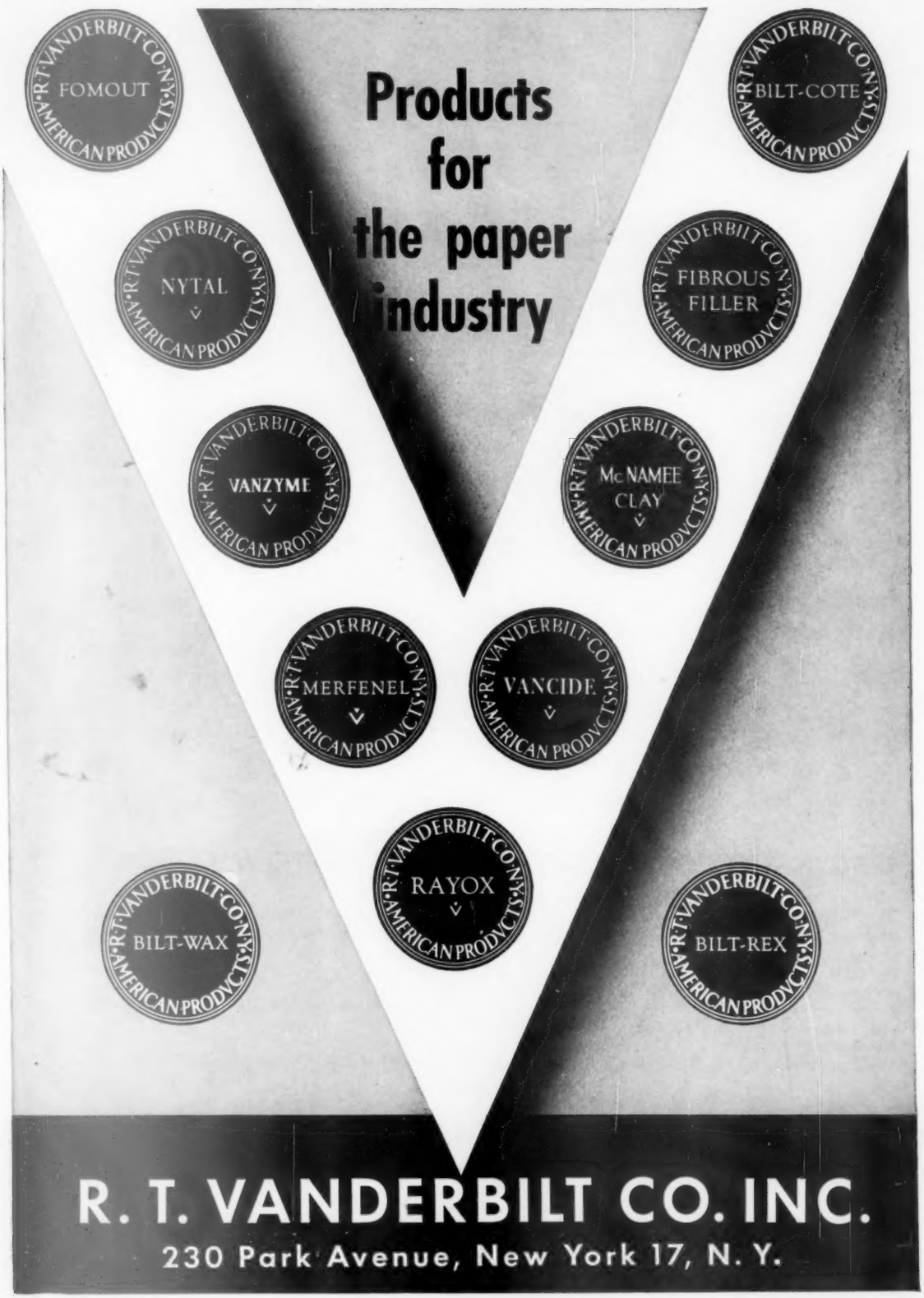
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NORTH AMERICA

MASS PRODUCTION OF U.S.A. MILLS is typified by these rolls in storage at Union-Bag Camp mill.

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NORTH AMERICA

United States

Business is good, but not spectacular. Industry operates in 95% capacity range. Looks like 35 to 36 million tons for 1960.

By MAURICE R. CASTAGNE and DON W. ZEIGLER, Assistant Editors

Population: 179,500,000. Per capita paper consumption: 437.8 lbs.

Production (short tons)	1958	1959
Paper and paperboard	30,797,000	34,051,000
Total chemical woodpulp	18,815,000	18,613,000
Chem. woodpulp (paper grades)	14,698,000	16,707,000
Dissolving woodpulp	933,000	1,092,000
Mechanical woodpulp	2,919,000	3,187,000
Semi-chemical woodpulp	1,548,000	1,265,000
All woodpulp*	21,734,000	24,257,000
Paper imports	5,135,945	5,558,516
Paper exports	852,775	792,633
Pulp imports	2,103,410	2,441,721
Pulp exports	515,245	652,529

Principal paper grades made: Containerboard, book paper, coarse paper. All grades are made.
Principal paper imports from: Canada.
Principal pulp imports from: Canada, Sweden, Finland.
Principal paper exports to: Canada.
Principal pulp exports to: Britain, France, West Germany, Canada.
*All woodpulp includes screenings as well as grades named above.

● Fresh from its remarkable recovery in 1958 and 1959, the U.S.A. pulp, paper and paperboard industry is heading for a record year. At midpoint 1960, paper and paperboard mills were operating at 95% capacity, produced a record 8.8 million tons in the first quarter, 14.63 million tons in the first five months and probably about 17.5 million tons by midyear.

If this keeps up—and it probably will—the U.S. mills will produce 35 million tons in 1960, possibly 36 million. This is not as over-optimistic as it may seem. Production of paper and paperboard in 1959 of 34 million tons was 11% higher than 1958's 30 million tons. A similar increase in 1960 would mean 37.4 million tons production.

This is the midpoint 1960 picture for the U.S.A.'s giant ($12 billion sales) paper industry. Continued success hinges upon many factors. Some are population growth, growth in per capita paper consumption, consumer money available for spending (now at a peak), the export picture (it's better this year, so far), a balanced capacity-production - expansion - consumption position (new machines appear to be well distributed among different grades); the new Federal law restricting food additives; the election year (a boon for printing papers).

The FAO study which projected future world pulp and paper demands for 1965 and 1975 may also act as a stimulant upon the U.S. pulp and paper industry.

Some Plus Factors

This nation of 179.5 million people uses an average of 437.8 lbs. per person. Every child born in the U.S. will use an estimated 18 tons of paper during his lifetime. This is why both population growth as well as increase in per capita consumption are major factors affecting the growth of the pulp and paper industry. Since 1929, population growth has been responsible for 24% of paper and

U.S. PAPER AND PAPERBOARD INDUSTRY

Year	*Domestic Production*	*Imports*	*Exports*	*Total Supply*	*Population In Thousands*	*Apparent Per Capita Consumption In Lbs.*	*Domestic Production Requirements For 450 Lbs. Per Capita*	*500 Lbs. Per Capita*	*Industry Capacity Historic Basis*
1925	9,001,742	1,567,121	152,351	10,416,512	115,800	180	—	—	11,623,450
1939	13,509,642	2,687,494	248,569	15,948,567	130,900	244	—	—	16,557,410
1946	19,277,667	3,625,982	393,250	22,510,399	141,200	319	—	—	20,420,000
1950	24,375,083	5,008,222	371,546	29,011,759	151,700	382	—	—	26,100,000
1955	30,178,102	5,386,174	845,233	34,719,043	165,300	420	—	—	30,900,000
1956	31,441,192	5,836,030	786,209	36,491,013	168,200	434	—	—	32,600,000
1957	30,677,548	5,466,427	869,713	35,274,262	171,200	412	—	—	34,300,000
1958	30,811,000	5,337,556	834,719	35,313,837	174,100	406	—	—	36,100,000
Pre. 1959	34,051,000	5,573,000	749,000	38,875,000	177,000	439	—	—	37,300,000
Est. 1960	36,000,000	—	—	40,820,000	180,100	453	36,000,000	—	38,700,000
1961					183,200	—	36,400,000	—	40,200,000
1962					186,300	—	37,100,000	—	40,600,000
1965					195,700	—	39,800,000	44,700,000	—
1970					208 to 214,000	—	43,300,000	48,600,000	—
1975					225 to 235,000	—	47,600,000	53,300,000	—
1980					245 to 260,000	—	52,600,000	58,900,000	—

Source: Writing Paper Manufacturers Association

paperboard's growth, 35% since 1946, according to the U.S. Pulp Producers Assn., Inc. Increases in per capita paper consumption have accounted for 76% of total growth since 1929. Since 1950, population has grown 18.5% in the U.S., an increase of 28 million people.

Gross national product (GNP) and personal income also are important to the growth of the pulp and paper industry. GNP in 1959 was $480 billion, up some $38 billion, an 8.5% increase over 1958. Personal income is higher than ever before, now stands at $398.5 billion for the nation's 45 million families and 11 million bachelors (statistically speaking, unattached individuals). Personal income for 1959 was $380 billion, up 6% over 1958.

Paper's Progress

Paper consumption, excluding paperboard, grew from 220.0 lbs. per person in 1950 to 241 lbs. in 1959. This is apparent consumption, because some of this growth is due to inventory building. This growth means that the national average use of paper increased 21 lbs. per person in 10 years.

Virtually all grades contributed to paper's 10.3% production rise in 1959 to 14,923,000 tons compared to 13,525,000 tons in 1958. Newsprint scored an 11.2% rise, uncoated book and printing papers, 15.5%, fine papers, 10.3%. Coarse paper grades were up 9.2%, glassines, 7.1% and all sanitary papers, 7.0% and tissues, 7.2%.

Machine coated papers, which had a phenomenal growth in the Thirties, appear to be on the move again and in 1959 climbed up 7.2% to 1,681 thousand tons from 1,568 thousand tons in 1958.

For the first four months of 1960, paper production was 5.3 million tons, an 8% increase.

Paperboard's Opportunities

Paperboard has an estimated 40% interest in the giant ($10 to $15 billion) packaging industry. On some fronts it is fighting increased competition from plastics and aluminum. On other fronts, it has joined with these competitors to produce a better product. To combat such competition, the paperboard industry has stepped up its research pace and has upgraded some of its products.

Paperboard production in 1959 was a record 15,970,000 tons, compared to 14,248,600 tons in 1958. This reflects a per capita paperboard use of 175 lbs. per person, up from 159.8 lbs. in 1958. Some 16.2 million tons of production are predicted for 1960. For the first quarter, paperboard production was up 4.6% to 3,974,570 tons and for the first four months had reached 5.4 million tons, a 3% gain.

One prominent growth paperboard grade, according to the National Paperboard Assn., is special foodboard, which scored a 10.1% gain in production in 1959 to reach 1,451,700 tons. Although the primary end use is still milk containers (488,300 tons), frozen food containers have stimulated an increase from 202,200 tons in 1950, 312,900 tons in 1955 and up to 400,500 tons in 1959. A considerable portion of special foodboard is coated.

Other major end uses for special foodboard are heavyweight cups, round nested food, liquid tight containers, milk bottle hoods and plugs (325,000 tons); plate, dish and tray (109,000 tons).

Forecasts

It is remarkable that the Stanford Report, prepared for Weyerhauser Co. in 1954, could so accurately forecast U.S. paper production so many years in advance. Stanford has estimated 32 million tons production by 1960. The industry reached and surpassed this figure in 1959 by 2 million tons. At this rate, the U.S. paper and paperboard industry may attain two to three years sooner the Stanford estimates of 42 million tons by 1965.

Here are some comparisons and other projections or forecasts for U.S. paper and paperboard production:

Year	*U.S.A. Production Short Tons*
1939	13,509,642
1942	17,083,862
1950	24,377,222
1951	26,086,115
1952	24,413,312
1953	26,458,781
1954	26,656,631
1955	29,883,060
1956	31,428,155
1957	30,700,008
1958	30,797,000
1959	34,051,000
*1960	32,000,000
*1965[a]	42,000,000
*1970	41,600,000
*1975	46,600,000
**1975	45,000,000
***1975	51,000,000

* *Forecasts by Stanford Research Institute on basis of population growth, technological advances and competition of materials.*

** *The President's Material Policy Commission forecast in 1952.*

*** *The U.S. Forest Service Timber Resource Review 1955.*

[a] *In 1958 Stanford Research Institute made recalculations of its projections on basis of data available since 1952. This is Stanford's revised estimate for 1965.*

U.S.—NEW MACHINES Installed in 1959

Grade for which Intended	*Machine Manufacturer's Rated 24-Hour Capacity (In Tons)*
Printing	250*
Fine	20*
Fine	45**
Printing and Fine	200
Printing and Fine	150
Newsprint	320*
Saturating Specialties	6
Tissue	13
Kraft Paper and Board	350
Kraft Liner Board	150*
.009 Board	250**
Insulating Board	150E*
Insulating Paper	50E

*Originally scheduled for 1958
**Replacement

U.S.—NEW MACHINES To Be Installed in 1960

(As of February 1960)

Grade for which Intended	*Machine Manufacturer's Rated 24-Hour Capacity (In Tons)*
Printing	200
Printing	200
Fine	13*
Fine	24*
Fine	90
Printing and Fine	150
Printing and Fine	160*
Printing, Fine and Specialties	220
Tissue	25
Tissue	70
Tissue	25
Towel and Light Weight Kraft	60
Glassine and Bleached Kraft Specialties	145**
Kraft Paper	300**
Kraft Paper	200
Bleached Kraft Board	340
Food Board	320
Linerboard	350
Linerboard	250
Specialty Board	50
Building Board	150
Building Board	100
Total Machines: 22	

*Replacement
**Originally scheduled for 1959

U.S.—NEW MACHINES For Installation 1961 and Later

(As of February 1960)

Grade for which Intended	*Machine Manufacturer's Rated 24-Hour Capacity (In Tons)*
Printing	140
Fine	60*
Fine	100
Printing and Fine	120
Newsprint	400
Bleached Board	300
Kraft Board	450
Containerboard	500
Linerboard	350
Linerboard	500
.009 Corrugating	125
Total machines: 11	

*Originally scheduled for 1960

Source: Writing Paper Mfrs. Assn., based upon their survey of paper machinery manufacturers.

Capacity

Officially, the paper and paperboard industry was operating in the 95% capacity range in mid-1960, but says one spokesman, this is not true capacity because business is really not that good. Actual capacity may be about 93%, which still is healthy.

In reckoning capacity of paper and paperboard, a definite distinction must be made between historical (or normal) and maximum (or all-out) capacities. Historical capacity is what a mill can produce under normal operating conditions. For some mills, historical capacity is 6 days, for others, 7 days. For paper mills, historical capacity is considered at 6 days operation/week, at 310 days/year. Paperboard is based on a 313-day year.

Maximum capacity is what a mill can produce operating 7 days/week, with deductions only for annual repair downtime and restrictions on days of operation in union agreements, etc.

This understanding of historical and maximum capacity is important because at the industry's high rate of historical capacity, an apparent need for more capacity is indicated. But additional capacity costs money, takes time and does not permit flexibility of profitable operating rate if business conditions change. It may be possible for a mill to gain the extra capacity it needs by closer scheduling of its production and by swinging from a 6 to 6½ or 7 day operation temporarily.

As it stands now, the U.S. paper and paperboard industry has a combined historical capacity of 37.289 million tons, a maximum capacity of 39.990 million tons. It added 13 paper machines in 1959, is adding 22 more in 1960 and at this date has 11 more on order for 1961 and on. In addition to the scheduled machine improvements reported in the official industry survey made by the American Paper & Pulp Assn. and the National Paperboard Assn., virtually every mill in the industry is rebuilding and improving its existing machines. It must. No mill can afford to stand still.

Is the industry adding too much capacity? In the valleys there is always too much capacity. The industry does not appear to be in a valley today. In the Fifties the industry operated much closer to capacity than in any other decade.

U.S. SURVEY OF PAPER CAPACITY BY TYPES—1958-1962

Historic Basis (in thousands of short tons)

Item	Total Paper	Newsprint	Uncoated Groundwood	Uncoated Book	Machine and Off-Machine Coated	Fine	Coarse	Special Industrial and Absorbent	Tissue
1958									
Capacity End of 1958	14,879	2,202	864	1,687	1,817	1,675	3,802	716	2,116
Daily Capacity End of 1958	47.17	6.28	2.79	5.44	5.86	5.40	12.27	2.31	6.82
1959									
New Machines	513	235	0	60	72	52	42	2	50
Improvements	270	9	−12	−8	143	69	26	34	9
Capacity End of 1959	15,662	2,446	852	1,739	2,032	1,796	3,870	752	2,175
Daily Capacity End of 1959	49.59	6.97	2.75	5.61	6.56	5.79	12.49	2.42	7.00
1960									
New Machines	424	0	0	26	67	116	164	15	36
Improvements	159	12	21	60	−4	28	15	14	13
Capacity End of 1960	16,245	2,458	873	1,825	2,095	1,940	4,049	781	2,224
Daily Capacity End of 1960	51.46	7.01	2.82	5.88	6.76	6.26	13.06	2.52	7.15
1961									
New Machines	327	0	38	42	57	68	61	16	45
Improvements	111	16	12	27	−20	51	−7	7	25
Capacity End of 1961	16,683	2,474	923	1,894	2,132	2,059	4,103	804	2,294
Daily Capacity End of 1961	52.87	7.06	2.98	6.11	6.88	6.64	13.23	2.59	7.38
1962									
New Machines	19	0	0	19	0	0	0	0	0
Improvements	51	29	0	5	6	10	−6	1	6
Capacity End of 1962	16,753	2,503	923	1,918	2,138	2,069	4,097	805	2,300
Daily Capacity End of 1962	53.07	7.14	2.98	6.18	6.90	6.67	13.21	2.59	7.40

Source: American Paper and Pulp Assn.

The Fiber Supply—Woodpulp

Woodpulp is the basic primary fiber in papermaking, 76% compared to 26% for secondary fibers. Woodpulp growth depends upon changes in papermaking furnish and upon increase in paper and paperboard production, according to a study made by the U.S. Pulp Producers Assn., Inc. Since 1929, 32% of the growth of woodpulp consumption has been due to changes in furnish; 68% from paper and paperboard production growth. According to estimates, changes in papermaking furnish will account for a 30% growth in woodpulp requirements in the Sixties; increases in paper and paperboard production, 70%.

Probably the most startling change in woodpulp is the sudden demand for U.S. market woodpulp in Europe. It was only a few short months ago that the industry had overcapacity on its hands, but in the first four months of 1960 U.S. exports of market pulp have soared 84%, a remarkable upsurge. As a result, there is no overcapacity; some see a pulp shortage looming.

The Export Problem

It is a problem. Although industry exports are up this year, U.S. pulp, paper and paperboard products face severe discrimination in export trade. This discrimination is not directed against the paper industry alone. It has reached such levels that it is a source of major concern to the U.S. government.

A major feature of the world trade picture in 1959, from a U.S. standpoint, was the decline of U.S. export trade surplus to less than $1 billion from $3.3 billion in 1958.

Although exports in 1959 of all U.S. products were about the same level as 1958, imports were up. U.S. exports of pulp, paper, paperboard and paper products to world markets were $337 million; up from $304 million in 1958. Total world trade is $90 billion; pulp and paper is $3 billion. Exports of paper and paperboard were a record 912,000 tons, a 7% rise over 1958. Paperboard scored this increase as paper exports were down. Paper and paperboard exports were 248,000 tons in 1939, have increased an average of 50,000 tons/year since 1950.

Pulp exports were 140,000 tons in 1939; 653,000 tons in 1959; have averaged better than a 50,000 ton/year increase. Pulp and paper exports showed a marked increase in the first

four months of 1960, woodpulp exports were up 44% to 284,000 tons and paper and paperboard (mostly paperboard) were up 10% to 296,000 tons. Historically, U.S. exports have averaged 2% to 3% of production.

To the threats of lower wages abroad, rising production and trade bloc tariff barriers, some industry advisers recommend that U.S. companies go international and invest in plants in other countries or work out franchise or royalty arrangements. Greater efficiency at home and new product development would meet the import threat and expand and create new markets abroad.

What's Coming?

How much will world paper consumption grow in the next five and ten years? In 1950 the Free World used an estimated 39,392,493 tons of paper and paperboard. In 1955 the whole world used 63,046,903 tons, and by 1958 this had reached 69,087,946 tons. Any assessment of the U.S. industry's potential should be based upon the world-wide picture. For this reason the industry is tremendously interested in the report issued by the FAO (Food and Agriculture Organization) on pulp and paper demand. Briefly, the report sees a world demand for paper and paperboard production of 89.5 million tons by 1965. By 1975, world demand of 134 million tons is estimated.

The big question is how much will the U.S. industry share in this anticipated growth. It is also interesting to conjecture how much the regional trade groups such as the common markets in Europe, Asia, Africa and South America will stimulate paper consumption. Also, what effect the emergence of new nations possessed with an insatiable thirst for a better standard of living and a higher literacy rate, will have upon paper consumption.

If the U.S. pulp, paper and paperboard industry is able to compete without discrimination in world markets, it can boost its capacity substantially. Most important, it has the raw materials for papermaking, an abundance of well managed forests skillfully harvested under the most scientific management terms for sustained yield. Annual growth on an estimated 40 million acres of U.S. forest lands owned by pulp and paper companies exceeds the harvest. Time and again U.S. companies have been cited for excellent forest management.

In addition, the U.S. industry has an estimated 1200 pulp digesters to produce pulp, an estimated 1575 paper machines, some old, some new, but most of them in top condition. Since 1949 the industry has invested $5,638,000,000 in new plants and equipment. If the U.S. and world trades climates are favorable, the industry stands ready to invest another $700 million to $1 billion/year in expansion and modernization. The industry also stands on the threshold of new breakthroughs in pulping and papermaking.

U.S. SURVEY OF PAPERBOARD CAPACITY BY TYPES—1958-1962

Historic Basis (in thousands of short tons)

		Containerboard								Boxboard			
		Liners			Corrugating Materials								
Item	*Total Paperboard*	*Cylinder Kraft*	*Fourd. Kraft*	*Jute*	*Kraft*	*Semi-Chemical*	*Straw*	*Other*	*Container Chip & Filler Bd.*	*Folding*	*Set-Up*	*Special Food Board*	*All Other*
1958													
Capacity End of 1958	16,877	183	4,771	948	130	1,996	117	627	306	3,100	688	1,743	2,268
Daily Capacity End of 1958	53.92	.58	15.24	3.03	.42	6.38	.37	2.00	.98	9.90	2.20	5.57	7.25
1959													
New Machines	141	0	47	0	0	0	0	0	0	0	0	94	0
Improvements	273	0	130	7	7	29	0	27	6	67	1	−19	18
Capacity End of 1959	17,291	183	4,948	955	137	2,025	117	654	312	3,167	689	1,818	2,286
Daily Capacity End of 1959	55.24	.58	15.81	3.05	.44	6.47	.37	2.09	1.00	10.12	2.20	5.81	7.30
1960													
New Machines	379	0	31	0	0	83	0	19	0	11	0	235	0
Improvements	282	−1	132	−4	−1	50	0	11	1	44	4	27	19
Capacity End of 1960	17,952	182	5,111	951	136	2,158	117	684	313	3,222	693	2,080	2,305
Daily Capacity End of 1960	57.35	.58	16.33	3.04	.43	6.90	.37	2.19	1.00	10.29	2.21	6.65	7.36
1961													
New Machines	931	0	595	0	0	336	0	0	0	0	0	0	0
Improvements	119	0	−25	−12	−4	11	0	9	1	42	4	52	41
Capacity End of 1961	19,002	182	5,681	939	132	2,505	117	693	314	3,264	697	2,132	2,346
Daily Capacity End of 1961	60.71	.58	18.15	3.00	.42	8.00	.37	2.22	1.00	10.43	2.23	6.81	7.50
1962													
New Machines	264	0	0	0	0	0	0	0	0	60	0	137	67
Improvements	33	0	8	0	0	0	0	0	0	14	3	5	3
Capacity End of 1962	19,299	182	5,689	939	132	2,505	177	693	314	3,338	700	2,274	2,416
Daily Capacity End of 1962	61.66	.58	18.18	3.00	.42	8.00	.37	2.22	1.00	10.66	2.24	7.27	7.72

Source: National Paperboard Assn.

U.S. NORTHEAST

Crossroads of indecision passed, mills will stay and expand

By MAURICE R. CASTAGNE
Editor for Northeast States

KRAFT PAVES WAY FOR EXPANSION at S. D. Warren Co's. Cumberland Mills, Maine operation. Switch from soda to 100% kraft has boosted pulp strength and now door is open to expand paper production.

—New York

● The 74 pulp and 314 paper mills of the Northeast have apparently reached a major decision to stay and expand at their present locations. Actually the question and the solution were never that simple. For some mills the problem was never presented in such clear cut terms. But in the past 10 to 20 years, many of the mills have thought about moving South.

Burdened with taxes, rising labor costs, dwindling raw material sources, etc., the North has looked to the South as a kind of promised land flowing with abundant low cost plant sites, favorable tax concessions, low labor costs, milder climate for year-round logging, faster growing trees, faster growing population and fastest growing everything else. Some mills answered the call.

Some didn't. When the softwood supply in the Northeast dwindled, some mills dug down deep into their research reserves and came up with new and old processes to use hardwoods. A few such mills were S. D. Warren, Oxford Paper Co., Brown Co., Finch, Pruyn & Co., Inc., Great Northern Paper Co., West Virginia Pulp and Paper Co., St. Regis Paper Co., and Gould Paper Co.

Other mills discovered that they could get better blends by purchasing their pulp requirements. This flexibility in pulp purchasing made them less vulnerable to customer changes. If a customer wanted a longer fibered or higher brightness pulp, these mills merely changed their buying habits.

The specialty mills of the Northeast also became adept at using non-cellulose fibers such as latex, glass, asbestos and synthetic fibers. A few examples are Mead's Hurlburt mill, C. H. Dexter & Sons, Inc., and Texon, Inc.

Now that the crossroads has been passed, the mills of the Northeast are on a vigorous expansion program. A prominent example is S. D. Warren Co. which wanted to expand its pulping and papermaking operations at its Cumberland Mills, Maine, operation. S. D. Warren realized that to be competitive it had to switch to kraft odor abatement installations in strength properties. But the mill is located near Portland, Maine, and had to consider the opinions of its neighbors. From a community relations standpoint Warren did a fine job. The company asked the advice of some of Portland's leading citizens including editors of influential newspapers. It told the group what it wanted to do and how it planned to go about it.

The group agreed with S. D. Warren, but told the company to take a more positive approach and stress the

NORTHEAST AND NORTH CENTRAL STATES PULPWOOD STATISTICS*

(In Thousands of Cords)

	Receipts				Yr. End
	Domestic	Imports	Total	Consumption	Inventory
1941	3,630	1,269	4,899	4,935	1,657
1945	3,676	1,101	4,777	4,689	1,075
1949	3,869	1,004	4,873	5,009	1,861
1950	3,940	1,060	5,000	5,497	1,300
1951	5,097	1,586	6,683	6,139	1,850
1952	4,881	1,422	6,303	5,724	2,260
1953	4,677	1,025	5,702	5,670	2,035
1954	4,643	1,095	5,738	5,805	1,640
1955	6,273	1,400	7,673	7,845	2,690
1956	7,265	1,477	8,742	8,351	3,095
1957	6,937	1,398	8,335	8,067	3,676
1958	6,060	1,101	7,161	7,671	3,146
1959	6,797	947	7,774	8,237	2,704

**Prior to 1955 the figures are for regions which the Census Bureau and War Production Board designated as Northeastern and Appalachian.*
Source: Bureau of the Census, except 1941 by War Production Board, 1951-2 by NPA, Pulp, Paper & Board Div.

NEW ENGLAND ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,490,325
1939	1,096,160
1946	1,592,089
1949	1,655,041
1952	1,909,565
1955	1,972,983
1956	2,189,964
1957	2,266,324
1958	2,381,513
1959	2,399,013
1960	2,397,341

Source: U.S. Pulp Producers Assn., Inc.

MIDDLE ATLANTIC STATES ANNUAL WOODPULP CAPACITY

(in short tons)

1934	981,305
1939	1,096,160
1946	1,038,893
1949	1,229,533
1952	1,315,572
1955	1,337,193
1956	1,420,007
1957	1,429,642
1958	1,481,640
1959	1,488,462
1960	1,397,555

Source: U.S. Pulp Producers Assn., Inc.

expansion possibilities. This the company did. From a technical standpoint, company engineers visited all kraft odor abatement installations in the U.S., devised a system of its own which included some of the better features it had seen in other mills. The system is better than 90% effective. Now that the company can expand its pulp production, it has cleared the way for expansion of its paper production.

Oxford Paper Co., too, faced the decision to build a new mill at Rumford, Maine, or go elsewhere. It decided to spend more than $15 million to increase its kraft pulp production at Rumford.

Fraser Paper, Ltd. at Madawaska, Maine, is scheduled to start up its new bond paper machine, 234-in. wide, sometime in 1960. Modern finishing room facilities were recently added.

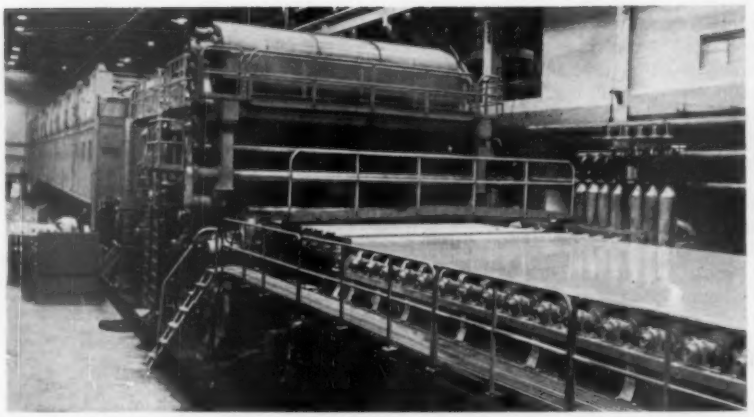
At Woodland, Maine, St. Croix Paper Co's. latest newsprint machine which started up in 1957, recently operated 128 continuous hours at 2,085 ft./min. producing a web 190-in. wide, 3,033 miles long. St. Croix has on the drawing boards some expansion plans that will cost several million dollars.

Standard Packaging Corp's. Eastern fine paper division's new kraft pulp mill at Lincoln, Maine, is reportedly producing a good quality bleached pulp. The mill started up in 1958, uses a Kamyr continuous digester for hardwood and softwood krafts. International Paper Co's. Livermore Falls, Maine, mill has installed an off-machine trailing blade coater for publication specialties and is now installing modern supercalendering and winding equipment. A new machine at its Ticonderoga, N.Y., mill starts up soon.

Garden State Paper Mills is planning a modern newsprint operation in New Jersey using a new process to repulp waste newspapers. Reportedly the company would use overruns from metropolitan dailies. Its tonnage has been said to be committed for several years.

Crane & Co. Inc. at Dalton, Mass., is adding a new fine paper machine for start-up about October 1960. Finch, Pruyn's neutral sulfite pulp mill at Glens Falls, N.Y., has been so successful that the company has added a second digester. No. 2 paper machine was scheduled for rebuilding in midyear with a new size press.

Hammermill Co's. Erie, Pa., mill is putting the finishing touches to its $20 million growth program. Included in the program are a goliath-sized finishing room (about the size of five football fields), additional Neutracel pulping and bleaching facilities (including the brand new Impco continuous digester), centralized and automatic broke handling facilities, power facilities and new sulfite pulping capacity.



NEWSPRINT SPEED RECORDS CHALLENGED by No. 4 newsprint machine at St. Croix Paper Co., Woodland, Maine. Machine operated 128 continuous hours at 2,085 ft./min. producing 190-in. wide web 3,033 miles long.

Kodak has just ordered a new paper machine for its Kodak Park paper mill at Rochester, N.Y. St. Regis Paper Co. is adding new off-machine coating facilities at Bucksport, Maine, and high density bleaching at Deferiet, N.Y. New York and Penn's Johnsonburg, Pa., mill has completed a $3 million bleach plant and new on-machine coating installations.

The story of Gould Paper Co. at Lyons Falls, N.Y., is always worthy of mention. Gould faced a serious shortage of softwoods for its sulfite pulp mill and in 1955 estimated it had about a five year supply left. It introduced the Bauer groundwood from chips process and is now a going concern; in 1959 doubled its pulping capacity and has rebuilt several paper machines.

C. H. Dexter & Sons, Inc., at Windsor Locks, Conn., unveiled its new Dextex in 1959. This is a Dacron fabric made by a "modified" papermaking machine and introduced initially for interlinings on men's wash and wear suits.

Because of the economic success of "noodle pulp" on the West Coast, one shipping company has express interest in shipping such pulp to East Coast paper mills.

No report on the Northeast would be complete without Crocker. Burbank & Co., Assoc'n at Fitchburg, Mass. Crocker, Burbank has 20 paper machines producing a tremendously wide variety of papers including condenser tissues, bristols, book and printing papers, shot shell papers and coated papers.

U.S. MIDWEST

Lake States complete decade of greater output, research

By DON W. ZEIGLER
Editor for Midwest States

—Chicago

● Research and increased production retained center-stage roles as the Midwest industry rolled into the 60's.

Output, though, took the honors as the 50's marked emergence of Wisconsin as the nation's leading pulp, paper and paperboard producer. Among the 42 states that turn out these products, Wisconsin now tops the list—with more than 10% of total output.

Says Dr. William R. Haselton, gen. mgr. of Rhinelander Paper Co. and gen. chairman of the Wisconsin Paper Industry Information Service: "It is estimated that production of pulp, paper and paperboard in Wisconsin amounted to more than 3,500,000 tons in 1959. This compares with the 34,100,000 produced in the entire country."

Wisconsin mills entered the 50's with annual output of some 2,400,000 tons.

Dr. Haselton looked to the future and forecast increasing gains for the state in this decade. However, he warned, foreign competition will be an ever-growing problem. Pulp and paper producers must find better ways of meeting it.

Reoriented Research Needed

"Cut costs or be priced out of world markets" was the warning made at the 23rd Annual Executives' Conference at the Institute of Paper Chemistry, Appleton, Wis. The

speaker was Dr. John G. Strange, president of the school. Relatively too much research now underway in the pulp and paper industry, he declared, is aimed a doing things better or more efficiently and not enough at doing things differently.

The meeting was attended by more than 250 top industry executives from throughout the country, who heard Dr. Strange declare that, "One of the primary objectives of industry is to improve its productivity and lower its unit costs."

Big Investments for Expansion

Again the Lake States refused to take a back seat in new mills, expansions and modernizations. One of the leaders—Kimberly-Clark Corp. at Neenah, Wis.—plans expenditure of $24,000,000 through 1960. Its chairman, John R. Kimberly, is confident. "After a two-year adjustment," he says, "the underlying demand for output is strong."

And across the border in Minnesota, Northwest Paper Co. is betting on the future at its Brainerd mill. During the summer the company dedicated a "thundering giant" turning out fine papers at speeds up to 2,000 fpm. The Beloit Iron Works unit is a 200-in. machine with 182-in. trim width. Daily capacity of the 365-ft. Fourdrinier is approximately 150 tons on a wide range of high-quality printing, writing and converter papers.

In Ohio, Mead Corp. brought into operation a spanking new 500-ton four-stage bleach plant at the Chillicothe div. With the new facility the range possibility is 86-88 GE brightness. One of the world's most modern, it met the test of start-up and was running smoothly six months after inauguration.

Warren Scores a First

Neighbor to the north, S. D. Warren Co. installed at Muskegon, Mich., what is probably the most modern refining and stock metering system in North America. The plant is one of the first in the industry to use magnetic flow meters for completely automatic proportioning of stocks, additives and dyes.

Hardwood, pine and purchased pulp all receive "separate treatment" bringing them to proper level of development before blending and final processing. According to one supplier: "This was the first mill to convert totally from batch to continuous blending in a single move." And no production time was lost in the switch.

LOG CONTROL STATION IS HEART OF OPERATION at rebuilt and redesigned woodroom of Thilmany Pulp & Paper Co., Kaukauna, Wis. Operator controls log flow, handling barker gates as well as "five fingers" (foreground).

Swinging full circle back to the Badger state, a Wisconsin firm aimed for reduction in manpower when it completely redesigned and rebuilt its woodroom. Thilmany Pulp & Paper Co. at Kaukauna realized a 50% savings in man-hours, and the crew still "more than keeps up with chip demand of the 300-ton kraft pulp mill." Five goals were achieved: (1) improved bark removal; (2) the handling of 100-in. logs up to 24 in. in dia.; (3) hourly output of 60 cords; (4) reduction in manual labor, and (5) minimum manpower needs.

The installation, incorporating a log control station called the "heart of the operation," is said to be unique in the industry.

Pulpwood Aim: Mechanization

Times have changed remarkably in Lake States pulpwood. Although new problems have of course emerged, production is up, efficiency increased. The observer of only a few short years ago could not possibly have foreseen the average woods worker of 1959 as a family man who either lived on the job the year around or commuted daily from a town location perhaps 40 miles distant. He now uses only the latest model power say to fall, limb and buck logs into 100-in. lengths and pile them for skidding at an average of 2½ to 3½ cords per day.

International visitors recognized the progress during a 1959 tour of a northern Wisconsin pine plantation. Some Swedish travelers described growth as "perhaps twice as good" as in their home country.

Most reforestation in Wisconsin is accomplished with mechanized tree-planting equipment, while in Sweden direct seeding has been in use 50 years or more.

An Inexact Phase

Representative of the numerous scientific meetings staged at Midwestern research and technical institutions during 1959 was the Fourth

LAKE STATES PULPWOOD PRICES BY SPECIES, 1957-58

(Dollars per rough cord, f.o.b. car)

Location	*Aspen*	*Other Hardwoods*	*Spruce*	*Balsam*	*Pine*
Wisconsin	12.50*	13.00	27.00	22.00	17.00
Upper Michigan	14.50	13.50	27.00	23.00	17.50
Lower Michigan	10.50	11.00	22.00	——	13.00
Minnesota	11.00	——	24.00	18.00	15.50

*Most aspen pulpwood cut in Wisconsin is trucked to mills at a delivered price averaging about $14.00 per cord.

LAKE STATES ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,363,535
1939	1,491,270
1946	1,725,783
1949	2,058,271
1952	2,315,722
1955	2,485,938
1956	2,619,214
1957	2,824,095
1958	3,065,914
1959	3,098,849
1960	3,285,476

Annual Pulp & Paper Conference held at Western Michigan Univ., Kalamazoo. Subject of discussion was the latest departures in mechanical treatment of fibers.

Close scrutiny was given "one of the most inexact phases of the paper industry" by more than 200 mill superintendents, managers and technical and quality control directors.

"There is considerable work that should be done toward improving the surprising inefficiency of applied horsepower utilization of present beating and refining operations," said Prof. Raymond L. Janes, asst. professor of paper technology at Western Michigan. "In spite of this inefficiency, mechanical treatment of fibers remains the most economical manner of preparation. In recent years the field of beater adhesives has grown to the point where now many mills use them as a crutch to compensate for inadequate or poorly controlled mechanical treatment of fibers. . . . Beater adhesives have a definite place in the paper industry, but they should be used to *supplement* rather than to replace proper mechanical treatment."

Two major needs were voiced during the one-day gathering: (1) Higher machine speed of greaseproof through (a) a new type pulp, (b) new beating methods or (3) new means of sheet formation, and (2) short fibers and high strength for book papers.

Mergers Take Midwest Spotlight

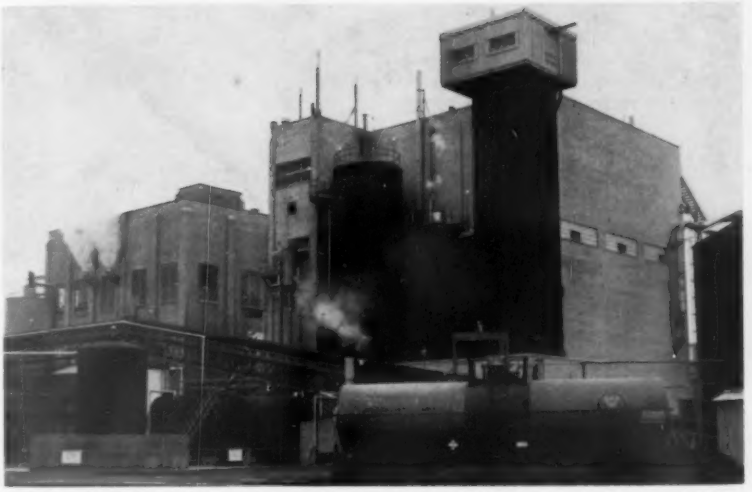
Mergers and outright acquisitions held high interest among industry executives during the year. Two were outstanding:

KVP Co. and Sutherland Paper Co., both of Kalamazoo, Mich., joined as KVP Sutherland Paper Co., linking two of the most respected names in the Middle American industry. . . . And in a cross-country merger Lee Paper Co., Vicksburg, Mich., was merged by Simpson Paper Co., Everett, Wash., to form Simpson Lee Paper Co. Not long after the Simpson-Lee announcement, the firm took steps toward construction of a $7,000,000 mill at Ripon, Calif., to produce tracing, base paper for blueprints, photographic base and text paper. The merger gave the new firm "one of the most complete paper lines in the United States."

Record of Wisconsin Paper Group 35 Wisconsin Companies Pool Car Shipments

(Selected comparative years)

	No. of Pool Cars Shipped	*No. of Tons Shipped*
1935	1,880	43,244
1940	2,714	68,367
1950	2,840	75,189
1955	3,025	78,859
1956	3,174	78,654
1957	3,130	80,682
1958	3,299	86,630
1959	3,348	88,703



MEETING THE EXACTING REQUIREMENTS of Mead Corp.'s coated and white paper mill in Chillicothe, Ohio, is new four-stage bleach plant. Facility includes a chlorine dioxide bleach sequence, has many unusual features.

And Expansions Maintain Pace

The close of World War II marked the beginning of a new era in the pulp and paper industry from coast to coast. The Midwest did not hesitate and maintained the pace set in the past 10 to 15 years.

Expansions and mergers were nearly a weekly phenomenon, and it is impossible (for reasons of space) to list them all here. Representative were some of the following projects, either announced, underway or completed during the past year:

Field Enterprises Inc., Chicago, purchased Manistique Pulp & Paper Co., Manistique, Mich., from the Trenton (N.J.) Times Newspapers and the James Kerney Foundation. Annual production: 30,000 tons—mostly newsprint. . . .

World's largest producer of coated publication and catalog papers under one roof will be possible distinction of Kimberly-Clark Corp.'s mill at Niagara, Wis., with completion of current expansion. A 50,000-ton machine with trailing blade coater is scheduled for installation, in addition to expanded mill facilities. . . .

At Nicolet Paper Corp., West De Pere, Wis., new No. 3 Fourdrinier (Valley Iron Works) is producing various grades of glassine. It more than doubles the capacity of Nos. 1 and 2, produces broader range. . . . Also at Nicolet Paper, what is said to be the largest glassine supercalender ever built was placed in operation. The 16-roll, 147-in. unit was built by Appleton Machine Co. . . .

Multimillion-dollar expansion was announced by Consolidated Water Power & Paper Corp. at Wisconsin Rapids, Wis. Firm will install enamel printing paper machine and erect coating preparation plant. Carbonate as well as starch and clay will be handled in bulk.

Progress in Forest Research

Government forest studies took many forms in 1959-60. Progress of no little importance was made in the field of inventorying and analyzing resources. Equally important were a program aimed at promoting acceptance of forestry projects and practices by small woodland owners and a report on problems of forest taxation that attempts to devise a more equitable system of land classification for tax assessment purposes; this will be based on market values of timberland as reflected in land sale data.

The annual survey of pulpwood production conducted by the Lake States Forest Experiment Station (U.S. Dept. of Agriculture) revealed an increasing use of hardwoods by area pulp mills.

Midwestern Odds and Ends

Pollution, always an important phase of pulp and paper in the Lake States, realized important gains during the past year. Research, of course, continued at an almost phenomenal pace, and millions of dollars were poured into continuing studies. Wastes were utilized for road binder at an always-increasing rate.

Big news came when state authorities gave support to an industry-backed project for turbine reaeration at strategic hydro plants to increase dissolved oxygen content. . . . An example of Wisconsin progress: Kimberly-Clark Corp. puts 70% less polluting material into the Fox River than it did 10 years ago.

And at the Marathon Div. of American Can Co. in Green Bay, Wis., no mill effluents now enter the stream. Used water is treated to cut discharge of fine solids, as well as oxygen demand. The $325,000 project included pipe lines, pumping stations and settling basins.

For the first time, industrial forests in Wisconsin passed the 1,000,000-acre mark in 1959. The state uses about 2,000,000 cords pulpwood per year, and 35-40% is homegrown.

Pulp and paper is an economic mainstay in Wisconsin. Its 40,000 employes constitute 9% of the total manufacturing payroll.

And a pulpwood measurement technique based on "fixed average density" has been developed by two foresters at the Univ. of Minnesota. The method is said to "give a close estimate of the amount of dry fiber in a load of wood—just what a paper company needs to know."

THE SOUTH MOVED AHEAD in 1959. An example: use of wastewood chips such as these arriving at a southern mill. Once viewed with skepticism, chip use now reaches 25% in some mills.

U.S. SOUTH

Expansion boom, continued research keynote Dixie

By WILLIAM F. DIEHL JR.
Editor for Southern States

—Atlanta, Ga.

● "Expansion" continues the key word in the South. Even in off years, it has been growth that has provided year-end headlines. In 1959, decidedly *not* an off-year, it provides one of the biggest stories yet.

Research, too, earned its share of space for 1959. This was particularly true in woodlands, where a concerted —although not industry-organized— effort to reduce manpower and increase production was carried out. Several major pulp and paper companies explored new methods and new equipment aimed at cutting the costly wood-handling problem. Experts predict that these efforts will be eventually unified and carried out on an industry-wide level, seeking universal answers.

But the real story was in the South's continued expansion. There seemed to be no stopping in this area. The industry has grown 159% since 1946—a period during which the national average was only 55%. Some 70% of the nation's expansion pulp- and paper-wise since World War II has been in Dixie. And 1959 showed no sign of changing the trend.

The year saw the beginning of promised projects and promise of new ones. At Counce, Tenn., Gunnar Nicholson's long-awaited 350-ton kraft mill was abuilding, will probably be in production next year. To the west, in Texarkana, Tex., Anglo-Canadian Pulp & Paper Co. Ltd., through its subsidiary, Anglo-Southern Paper Corp., announced that it will build a $30,000,000 mill, possibly to produce newsprint. In Baton Rouge, La., plans progressed for erection of Noralyn Paper Mills Inc.'s plant that is to produce newsprint from 100% native hardwoods.

The Noralyn process points the finger to still another growing Southern trend—continual search for new hardwood uses. Hardly a new machine is put on stream or a mill built in the South today that doesn't provide for hardwood. The past year saw hardwood use in the South increase by 25%, and research is currently underway that will probably boost that figure with each passing year. It is a necessary economic step. Some 55% of the South's 193,000 acres are hardwoods, once girdled and left on the stump to die. The new look is proving a tremendous economic step.

Another sign of progress in Dixie's woodlands has been its increasing use of sawmill chips. Less than five years ago use of wastewood chips from sawmills was looked on as remote possibility. Today, it is reality. Last year an estimated 2,500,000 cords of chips were used in the South. This represents a return to the lumber industry of nearly $10,000,000 and a vast new source of supply for paper. Some mills are already receiving up to 25% of wood requirements in chips, and indicate they intend to increase this usage.

PULPWOOD PRICES IN SOUTHEASTERN STATES

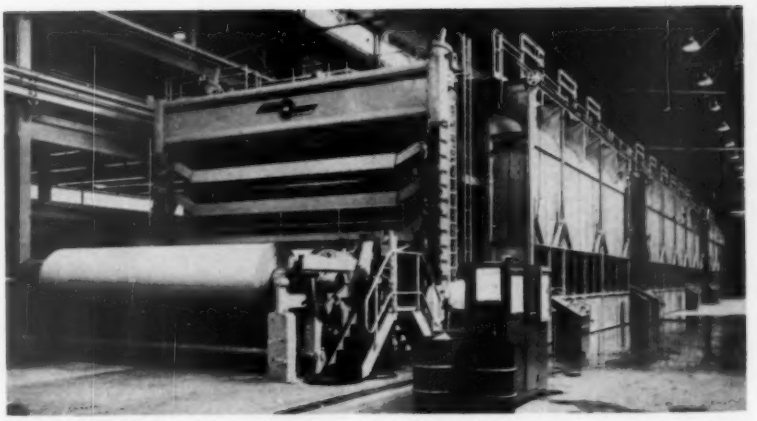
	Pine			*Hardwood*		
	Railwood	*Yardwood*	*Truckwood*	*Railwood*	*Yardwood*	*Truckwood*
1945	8.35	——	9.15	8.10	——	8.55
1946	9.90	——	10.75	9.50	——	10.55
1947	10.80	——	11.70	9.70	——	10.55
1948	11.65	——	12.30	11.00	——	11.25
1949	10.85	——	11.80	11.75	——	11.25
1950	11.85	——	12.55	10.70	——	11.50
1951	13.65	——	14.70	12.40	——	13.15
1952	13.70	——	14.70	12.40	——	13.15
1953	13.70	——	14.70	12.35	——	13.15
1954	13.75	——	14.75	12.30	——	13.15
1955	14.15	——	15.05	12.50	——	13.45
1956	15.15	——	16.45	12.90	——	13.90
1957	15.20	15.40	16.35	12.65	12.70	13.75
1958	15.20	15.40	16.10	12.45	12.50	12.85

Source: Southeastern Forest Experiment Station, Asheville, N. C.

In the field of expansion, growth seemed to be spreading into the new mills. International Paper Co. had no sooner put its $64,000,000 Pine Bluff, Ark. mill on stream than it announced a major $13,000,000 expansion program, including a new machine.

At Naheola, Ala., Marathon Southern Corp., in operation less than two years, is putting the finishing touches on its second Fourdrinier machine, third paper unit since start-up. Gulf States Paper Corp. has completed a costly addition to its Demopolis, Ala. pulp mill, now can produce bleached paper and board. In Augusta, Ga., as Continental Can Co. prepared to put the final touches on its new 350-ton bleached board mill, Deerfield Glassine Co. announced it will build the South's first glassine plant nearby, receive slush pulp by pipeline directly from the new Continental mill. In Catawba, S.C., Bowaters Carolina Corp. puts its new pulp mill in full operation, immediately announces a $60,000,000 expansion program, which will include two new machines.

This was the frantic pace set by the new mills that pushed the South's total



EXPANSION WAS IMPRESSIVE in existing facilities such as this new machine, the seventh, for Union Bag-Camp Paper Corp. at Savannah, Ga. New addition gives company almost undisputed claim as the world's largest paper and pulp mill.

U. S. SOUTH—Use of Chips from Sawmill and Veneer Waste

	Pine	*Hardwood*
Alabama	291,955	47,866
Arkansas	321,146	6,796
Florida	122,891	4,066
Georgia	352,319	18,138
Louisiana	159,734	25,360
Mississippi	93,490	37,917
N. C.	274,421	15,038
Okla.	16,741	—
S. C.	191,794	24,080
Tenn.	665	5,591
Texas	278,949	14,534
Virginia	73,831	7,086
Total 1959	2,177,936	206,472
Total 1958	1,581,100	145,800
Total 1957	1,058,400	144,600

U.S. SOUTH—PULPWOOD Receipts—Consumption—Inventories

(In thousands of cords)

Yr.	*Receipts*	*Consumption*	*Yr. End Inventory*
1941	6,400	6,227	334
1943	6,505	6,342	293
1945	7,153	7,208	145
1947	8,227	8,395	291
1949	9,060	9,255	670
1950	11,543	11,480	753
1951	12,844	12,854	772
1952	13,381	13,330	856
1953	14,959	14,752	1,089
1954	14,962	15,014	1,048
1955	18,708	19,027	921
1956	20,582	20,203	1,325
1957	20,023	20,308	1,055
1958	20,207	20,507	1,335
1959	22,743	22,997	1,191

Source: Bureau of the Census; except 1941-1943, by War Production Board; 1951-52—NPA, Pulp, Paper & Board Div.

PULPWOOD PRODUCTION STATISTICS FOR SOUTHERN STATES

(in cords)

Especially gathered and prepared by PULP & PAPER from U.S. Forest Service data.

	Virginia	*North Carolina*	*South Carolina*	*Georgia*	*Florida*	*Southeast Total*
1946	971,000	709,000	1,002,000	1,143,000	865,000	4,711,000
1947	1,025,400	765,200	948,400	1,215,200	881,700	4,835,900
1948	1,306,500	926,200	1,108,500	1,770,600	1,221,200	6,330,000
1949	895,200	802,100	1,012,200	1,790,500	1,036,100	5,536,100
1950	1,044,147	1,024,005	1,182,413	2,221,279	1,384,694	6,856,538
1951	1,326,333	1,304,540	1,251,045	2,370,143	1,490,325	7,742,386
1952	1,069,129	1,332,303	1,275,698	2,513,272	1,583,341	7,773,743
1953	1,267,347	1,528,929	1,446,157	2,879,168	1,674,864	8,796,465
1954	1,258,400	1,507,400	1,330,900	3,057,500	1,661,600	8,815,800
1955	1,406,320	1,573,972	1,513,313	3,759,540	1,828,541	10,081,686
1956	1,629,706	1,842,162	1,806,162	3,849,942	1,950,653	11,079,034
1957	1,487,926	1,900,021	1,791,436	3,812,951	1,991,922	10,983,756
1958	1,449,800	1,896,100	1,747,800	4,092,900	1,834,900	11,021,500
1959	1,643,472	1,834,074	1,709,922	4,354,499	1,979,341	11,521,308

	Oklahoma	*Texas*	*Arkansas*	*Louisiana*	*Southwest Total*
1946	13,300	616,000	577,000	787,000	1,993,000
1947	29,900	711,100	596,600	870,300	2,207,900
1948	34,300	823,600	616,700	953,800	2,428,400
1949	37,900	790,900	561,300	759,800	2,149,900
1950	38,831	922,304	603,682	883,306	2,448,123
1951	44,618	1,158,371	613,792	1,110,961	2,927,742
1952	34,870	1,159,918	619,664	1,234,745	3,049,197
1953	41,028	1,210,704	780,982	1,375,500	3,408,214
1954	33,000	1,054,300	826,300	1,504,200	3,417,800
1955	38,073	1,203,775	876,999	1,650,152	3,768,999
1956	74,535	1,459,015	934,734	1,574,218	4,042,502
1957	59,904	1,421,346	1,042,386	1,564,184	4,087,820
1958	63,100	1,386,000	1,314,400	1,583,600	4,347,100
1959	38,097	1,120,048	1,192,363	1,612,062	3,962,570

	Tennessee	*Mississippi*	*Alabama*	*Total Mid-South*	*Total All-South*
1946	135,000	1,238,000	756,000	2,130,000	8,844,000
1947	141,300	1,279,100	777,700	2,198,100	9,241,900
1948	181,700	1,433,900	981,900	2,597,500	11,358,900
1949	158,100	1,167,700	911,300	2,237,100	9,923,100
1950	143,958	1,665,863	1,321,204	3,131,025	12,435,686
1951	191,415	1,793,376	1,406,207	3,390,998	14,061,126
1952	268,438	1,861,388	1,608,609	3,738,435	14,561,375
1953	234,162	1,922,975	1,765,140	3,922,277	16,126,956
1954	240,300	1,963,800	1,831,900	4,036,000	16,269,600
1955	326,634	1,908,495	1,928,828	4,163,957	18,014,642
1956	392,156	2,069,033	1,601,466	4,062,655	19,685,236
1957	341,194	2,075,702	2,294,189	4,711,085	19,782,661
1958	354,600	1,885,000	2,624,600	4,864,200	20,252,800
1959	346,077	1,875,544	2,582,142	4,803,763	20,287,641

Note—Because of rounding, state figures may not add up to totals.

Sources: Southern and Southeastern Forest Experiment Stations of U.S. Forest Service.

to 69 pulp and paper plants with replacement value of $3.3 billion.

But, the South also set the pace in expansion and modernization of older facilities. Rome Kraft Corp., Rome, Ga., is undergoing expansion that will push capacity to 500 tons a day, most of it container board; Scott Paper Co. in Mobile, Ala., is nearing completion of a $10,000,000 expansion program that will boost annual production from 170,000 to 240,000 tons; Buckeye Cellulose Corp. unveiled its new "mirror" facilities, a $2,000,000 project boosting production to 200,000 tons of dissolving pulp a year.

A new firm, Florida Gulf Fibre Co., announced a $13,500,000 paperboard mill at Port St. Joe, Fla., will use hardwoods in semichemical pulping.

Olin Mathieson Chemical Corp. at West Monroe, La., embarked on a $12,000,000 two-year expansion program to broaden its packaging line and increase pulp and paper production; Crossett Co., Crossett, Ark., started a $6,000,000 flakeboard plant adjacent to its paper mills and then began work on facilities to apply coating to its bleached foodboard, a $1,500,000 addition, topped this off with a joint announcement in May that Union Bag-Camp Paper Corp., Savannah, Ga., is considering purchasing its sweeping facilities for $156,000,000. In Elizabeth, La., Calcasieu Paper Co. Inc. put finishing touches on a vast expansion program that included new wood-handling facilities, new paper machine building, new lime recovery plant, new warehouse and administration facilities; Champion Paper & Fibre Co. at Canton, N.C., dedicated its 20th machine, boosting capacity to 750 tons of paper a day, 225 tons paperboard, and ending a 10-year expansion program that increased total capacity from 90,000 to 100,000 tons a year; Owens-Illinois got its new 170-in. machine in production at Big Island, Va., increased production by 30%, adding 265 tons a day to output.

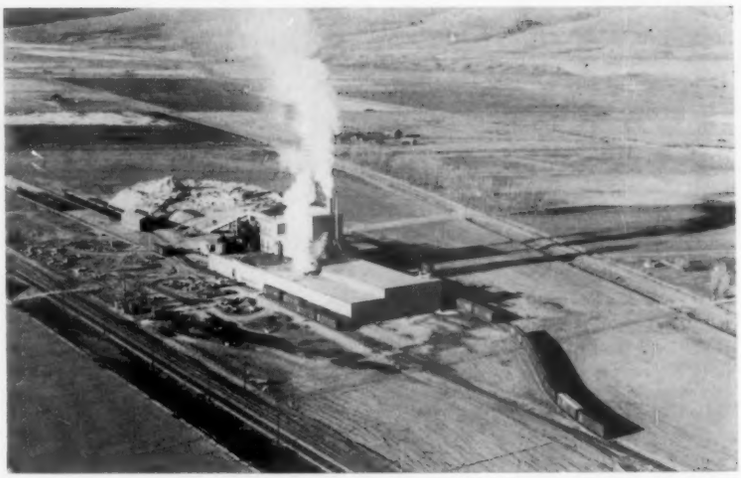
SOUTH

ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,213,650
1939	3,399,170
1946	5,715,475
1949	7,496,004
1952	9,928,030
1955	12,458,547
1956	13,430,628
1957	14,780,786
1958	15,719,487
1959	16,229,965
1960	17,131,925

Source: U. S. Pulp Producers Assn., Inc.



FIRST PULP MILL IN MONTANA, now joined by "sister" paper mill, is Waldorf-Hoerner Paper Products Co., at Missoula, making semichemical bleachable kraft pulp and paperboard.

U.S. FAR WEST

Increases output, wood use, product line and tax payment

By LOUIS H. BLACKERBY
Editor for Far Western States

—Portland, Ore.

● The industry continues to expand in the Western states, particularly in penetrating forest regions previously untapped as far as pulp production is concerned. Construction of packaging plants has taken on a rather brisk tempo. With minor exceptions, earnings were higher in 1959 than the year before and returns for early 1960 are even better.

More than ever before, the Western states pulp industry is based on raw product material derived from mill and forest residues. This genuine, practical conservation has already resulted in vastly "stretching" the forest supply as far as usable wood is concerned.

One West Coast manufacturer alone used chips from residues equivalent to 290 million bd. ft. of logs last year. Assuming an average merchantable stand of mature timber as 40,000 bd. ft. per acre (low for some Western species and locations, high for others), this 290 million ft. volume is equal to the entire timber stand on 7,200 acres of forest land. Because this organization obtains 40% of its pulpwood as chips from residues (chiefly from sawmills and veneer or plywood plants), it saved 290 million bd. ft. of timber from harvesting in 1959.

Except that the percentage (total pulpwood requirements obtained in chip form) of the West Coast industry exceeds the 40% achieved by this one firm, these wood savings can be extended to the entire Western industry. Of new pulp mills built in the Western states during the past two years, all but one operate exclusively on chips derived from lumber and veneer residues. The lone exception is the new Alaska Lumber & Pulp Co. dissolving pulp mill at Sitka. Although located in an area involving long wood transport and but a limited number of forest products plants, it appears likely even this remote mill may utilize purchased chips to augment its wood supply.

Now Under Construction

A high-speed paper machine of 70,000 ton/yr. capacity is being added at Grays Harbor Paper Co. plant (joint operation of Rayonier Inc. and Hammermill Paper Co.) at Hoquiam, Wash. When completed late in 1961, this will become a 2-machine plant

PACIFIC COAST STATES

ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,296,265
1939	1,659,430
1946	2,057,974
1949	2,578,964
1952	3,302,501
1955	4,152,828
1956	4,537,718
1957	4,857,684
1958	5,068,049
1959	5,157,332
1960	5,610,286

Source: U.S. Pulp Producers Assn., Inc.

producing an extended line of papers, both Rayonier and Hammermill brands.

Fibreboard Paper Products Corp. began construction in June last year of an integrated kraft pulp mill and linerboard machine at Antioch, Calif. This 72,000 ton/yr. expansion is scheduled for completion later this year. The company completed two corrugating plants early in 1960—one in Honolulu, Hawaii, the other at Phoenix, Ariz.

Menasha Wooden Ware Corp. has undertaken construction of a 125 ton/day neutral sulfite semi-chemical pulp-paper mill at North Bend, Ore., to be in production by mid-1961.

The doubling of capacity at Georgia-Pacific Paper Co.'s. Toledo, Ore. kraft pulp-paper plant with a 300 ton/day addition is nearly completed.

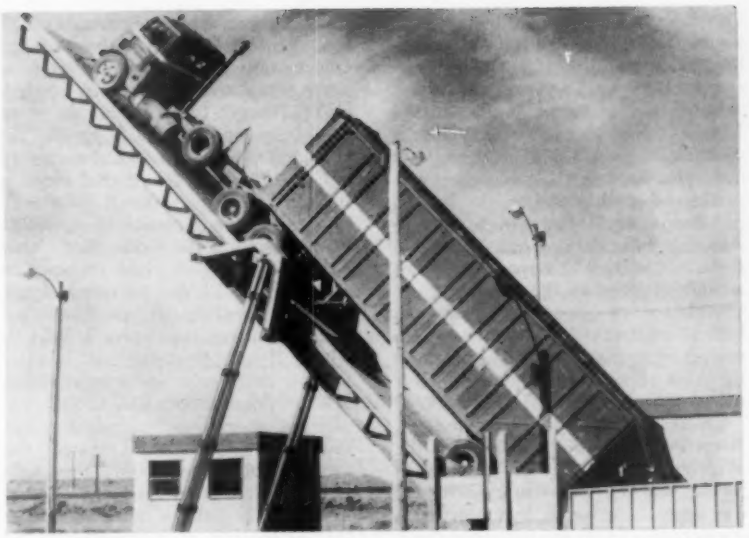
St. Regis Paper Co.'s. $30,000,000 expansion is under way at Tacoma, Wash. Completion will increase rated capacity of this operation to 250,000 tons/yr.

Longview Fibre Co. recently completed installing one new replacement machine, shortly after having announced ordering No. 9 to replace another small existing machine.

Waldorf-Hoerner Paper Products Co., Missoula, Mont., is currently getting pulp production up to the 400-500 ton/day capacity range. The plant's new paper mill starts up this summer.

1959 Start-Ups

Boise Cascade Corp. started production at its Cascade Kraft Corp. kraft pulp-paper mill at Walulla, Wash. early last year. Designed for 150 tons/day, it was operating at 175 tons/day by year's end. Plans are already formulated for expanding the plant, while Boise Cascade's third corrugated container plant is being constructed near Denver, Colo.



ALL CHIPS, NO ROUND WOOD is used by Cascade Kraft Corp's. 150 tons/day pulp and paper mill at Wallula, Wash. Mill thrives solely on sawmill residue chips. Parent company, Boise Cascade Corp. operates 12 sawmills producing 300 million bd.ft./year.

Alaska Lumber & Pulp Co. inaugurated production of its new 120,000 ton/yr. MgO dissolving pulp mill at Sitka, Alas. late in 1959. According to some observers it had one of the most successful start-ups on record.

Confirmed and unconfirmed reports indicated much interest in building new mills. Three firms have shown interest in building in Arizona, a state which now has but a single, small pulp mill. One of the interested firms has placed orders for equipment, including two machines, with view to providing both newsprint and kraft. Another firm has been surveying water supplies for a prospective plant.

New mills are being considered for Montana, Idaho, Colorado, California, and Oregon.

As to Alaska's new mill prospects, two firms holding government timber contracts (involving prospective pulp mill construction) have not yet made commitments as to whether they will actually install pulp facilities or not. One of them, Georgia-Pacific Alaska Co., with headquarters at Portland, Ore., has until mid-1961 to decide and still meet terms of the timber contract. Pacific Northern Timber Co., the other firm recently erected a sawmill at Wrangell. This qualifies the organization as far as a portion of its over-all federal timber acquisition is concerned but erection of at least a small pulp mill will be required for full contract qualification.

Two of the four prime sales of federal timber in Alaska are being carried out as per the terms specified by utilizing harvested wood in the manufacture of high-grade dissolving pulp by Ketchikan Pulp Co. and Alaska Lumber & Pulp Co. All four of the timber sales have been confined to coastal Alaska. The interior has extensive forests estimated at twice the volume of the coastal forests. This timber has a net annual growth estimated at 4 billion bd. ft. but is scattered and remotely located. Volume per acre runs considerably less than in the coastal forests.

Other Interests and Activities

Some of the pulp-paper firms are showing increased interest in the manufacture of solid wood products.

Crown Zellerbach Corp., which has

U.S. PACIFIC COAST—PULPWOOD
Receipts—Consumption—Inventories

(In Thousands of Cords)

Yr.	Receipts			Consum.	Yr. End Invent.
	Domestic	*Imports*	*Total*		
1941	2,585	332	2,918	3,019	742
1945	2,470	126	2,596	2,472	420
1949	3,015	148	3,162	3,199	1,031
1950	3,244	287	3,531	3,822	772
1951	4,565	261	4,826	4,490	1,070
1952	4,339	155	4,494	4,499	1,133
1953	4,463	—	4,463	4,692	1,108
1954	4,924	—	4,924	5,425	959
1955*	5,967	531	6,498	6,484	1,166
1956*	7,355	497	7,852	7,201	1,808
1957*	7,175	436	7,611	7,287	1,922
1958	6,312	338	6,651	7,033	1,464
1959	(combined)		7,696	7,677	1,277

Source: Bureau of the Census; except 1941, by War Production Board; 1951-52 —NPA, Pulp, Paper & Board Div.
*Includes Alaska

Canadian operations producing both lumber and plywood in major quantities (since acquiring Canadian Western Lumber Co. several years ago), will be manufacturing lumber in the U.S. by year end. The company is erecting a sawmill at St. Helens, Ore. near the modern CZ veneer plant.

Regarding this 60 million bd. ft. per year sawmill, to be in production late this fall, Reed Hunt, Crown Z president, stated "it is part of a very significant trend in the company . . . the change of pace has to do with better utilization of our old-growth timber of lumber and plywood quality and, above all, more effective utilization of leftovers."

International Paper Co. and St. Regis Paper Co. both moved into the Western lumber-plywood industry of recent years in king-size capacity via the acquisition route. By observation it's apparent other leading pulp-paper producers of the nation are interested in acquiring Western timberlands, both with and without sawmills and/or veneer-plywood plants. Some of the firms susceptible to acquisition own extensive amounts of timberland and have shown little or no interest in getting into the pulp production field.

Small Mills

However, interest in the practicality of small to "very small" pulp mills—in which several lumber firms expressed active interest in some two to four years ago—appears to be reviving. One eastern Washington lumber producing organization recently undertook a survey to ascertain the practicality of operating a pulp mill in conjunction with existing sawmills.

Evans Products Co. started production this year of a small pulp mill located on the plantsite of its hardboard plant at Corvallis, Ore. This pulp mill has production capacity of up to around 10 tons per day and can produce a variety of specialties, including battery separators—a field in which Evans Products has been a leading participant for several years.

The pulping process, reportedly yielding separators of high quality and in-use performance, eliminated the former dependence on top-grade wood. Now the raw product wood is in chip form and can be derived from logs, pulpwood, or mill residues.

Interest In Silvichemicals

The challenge of making chemicals from wood is receiving increasing attention of the industry. More people are talking, thinking, and doing something about silvichemicals than ever. Of recoveries already attained, a large portion is in the low-value area of heat and process-chemical recovery.

The kraft industry is, however, making important progress. A few by-products of alkaline pulping—turpentine, tall oil, lignin dispersing agents, etc.—are boosting annual sales by some $30 million. There are indications that the kraft industry is on the threshold of becoming a source of basic chemicals. Dimethyl sulfide, for example, is currently produced by Crown Zellerbach Corp. on pilot plant basis.

Georgia-Pacific Corp. anticipates early start-up of pilot plant production of cyanide chemicals in the range of 200,000-300,000 lbs. per month. This process will utilize bark and sawdust.

Weyerhaeuser Co. has been involved in pioneering and commercial production in the products-from-bark field during the past several years. The firm's research scientists are continuing these efforts with emphasis on bark and whole-wood fiber products.

Puget Sound Pulp & Timber Co., a commercial producer of industrial alcohol from spent sulfite liquor for some 15 years, has extended its by-product production to include lignin products covering a broad range of specialty applications.

NEW APPROACH TO EXPORTS
Specially written by Frank Meissner for this WORLD REVIEW NUMBER
see page 267

How States Rank . . . 1958

Washington in pulp and Wisconsin in paper production retain their No. 1 positions

HOW STATES RANK IN PULP PRODUCTION

(in short tons for latest available years)

	1957	1958
1. Washington*	2,793,383	2,592,347
2. Georgia	2,192,108	2,138,848
3. Florida	2,137,016	2,102,162
4. Louisiana	1,525,832	1,434,254
5. Maine	1,561,152	1,409,854
6. Alabama	1,450,906	1,127,630
7. Wisconsin	1,190,697	1,180,726
8. North Carolina	1,111,493	1,113,349
9. Virginia	1,013,976	1,095,275
10. Oregon	896,698	970,045
11. Texas	578,933	568,303
12. New York	537,852	516,524
13. Pennsylvania	410,383	410,411
14. Michigan	301,746	390,234
15. Ohio	203,012	120,190
16. New Jersey	78,154	83,082
TOTALS (for all states)	21,800,209	21,795,652

*Includes Alaska

STATES RANK IN PAPER/BOARD PRODUCTION

(in short tons for latest available years)

	1957	1958
1. Wisconsin	2,043,374	2,061,756
2. Florida	1,828,920	1,817,594
3. New York	1,784,568	1,795,111
4. Georgia	1,825,028	1,749,739
5. Louisiana	1,725,791	1,671,441
6. Michigan	1,605,228	1,657,950
7. Maine	1,703,674	1,608,794
8. Pennsylvania	1,615,048	1,599,184
9. Ohio	1,486,863	1,480,938
10. Washington	1,540,525	1,476,080
11. New Jersey	1,115,739	1,123,568
12. Virginia	1,143,818	1,113,708
13. California	1,023,654	1,090,312
14. Alabama	856,059	955,073
15. South Carolina	904,763	938,533
16. Illinois	845,322	835,533
17. North Carolina	853,576	834,860
18. Minnesota	824,905	830,530
19. Massachusetts	734,010	760,092
20. Mississippi	708,682	687,208
21. Texas	636,498	656,854
22. Tennessee	670,343	643,913
23. Connecticut	311,945	308,796
24. Maryland	299,485	301,382
25. New Hampshire	308,370	298,674
26. Indiana	308,708	282,657
TOTALS (for all states)	31,428,155	30,774,800

U.S.A. Newsprint

Newsprint consumption in the United States is again on the rise and in 1959 reached 7,103,785 tons, up 7.6%. Canadian mills supplied 5,117,766 tons; Europe, 128,630 tons; and U.S. mills, 1,909,242 tons. U.S. newspapers ran an average of three more pages per issue, a record of 39 to 42 pages per issue.

Idle newsprint capacity in North American mills is an estimated 1 million tons and still plagues the industry. If the move to put Canadian newsprint mills on a 7 day basis is successful some 700,000 tons more capacity would be added. A magnetic pull on idle newsprint capacity, according to the Newsprint Information Committee, which represents Canadian newsprint mills, is the attraction of producing more profitable grades such as groundwood specialties.

Newsprint mills are particularly interested in converting some of their operations to coating. Because of their high speed machines, newsprint mills could mass produce coated papers on a tremendous volume, especially publication grades for the mass circulation magazines such as Life and Look. Two major U.S. newsprint producers have been studying this market for several years and one mill is reported ready to install coating equipment.

Two U.S. newsprint mills are definitely converting 100,000 tons of newsprint and a third mill, 40,000 tons. One mill in Texas has announced it is switching to lightweight krafts.

U.S. newsprint capacity is estimated at 2,390,000 tons, with production for 1959 at 1,964,131. U.S. exports dropped to 120,000 tons in 1959, down from 127,000 tons in 1958 and 174,000 tons in 1957. Exports went to Central America (4,000); Mexico (22,000 tons); South America (44,000); Philippine Republic (28,000 tons). Less than 1,000 tons apiece were shipped to Europe, West Indies, Hong Kong and Africa.

Consumption

Daily newspapers in the fifty states in 1958-1959 had a total circulation of 58,299,723 copies, a 1.2% increase over 1958's 57,594,454. Sunday paper circulation was up 1.7% to 47,848,477 copies. 84.5% of the U.S. population of 179.5 million read a newspaper on an average day. Per capita newsprint consumption in the U.S. is estimated at 79.4 lbs. per person, up from 74.4 lbs. in 1958 but still under the high of 83.7 lbs. in 1956.

The narrow column width trend (11 picas vs. 12) saved newspaper publishers an estimated 312,000 tons in 1959. This was a $42 million saving, but substantially most of this was spent on new equipment and changes necessary to handle the narrower column width. According to one source, the narrow width trend appears to have run its course in 1959.

Newsprint Prices

Newsprint prices have not changed since March 1957, but publishers still continue to list increased newsprint prices at the top of their lists citing higher operating costs. Newsprint producers have protested such action.

Because of the growing tax burden some Canadian mills face, coupled with increased competition by Southern U.S. newsprint mills, a few Canadian mills have openly talked about setting up operations in the U.S. The latest such move, which appears to be genuine, is the announcement by Anglo-Canadian Pulp & Paper Mills Ltd. that it has established a subsidiary, Anglo-Southern Paper Corp., for a pulp and newsprint mill near Texarkana, Texas.

COMPANIES PRODUCING NEWSPRINT IN U.S.A.

Especially prepared by PULP & PAPER (Copyright by PULP & PAPER)

	1926	*1946*	*1952*	*1956*	*1959*	*1960*
Alexandria Paper Co. .	15,000	—	—	—	—	—
Algonquin Paper Co. .	29,000	—	—	—	—	—
Blandin Paper Co.	22,000	—	—	—	—	—
Bowaters Southern Paper Corp.	—	—	—	180,000	375,000	400,000
Cliff Paper Co.	13,000	—	—	—	—	—
Consolidated Water P. & Pa.	102,000	—	—	—	—	—
Coosa River Newsprint Co.	—	—	115,000	140,000	270,000	270,000
Crown Zellerbach Corp.	174,000	200,000	210,000	240,000	248,000	250,000
Cushnoc Paper Co. ..	20,000	—	—	—	—	—
De Grasse Paper Co. .	56,000	—	—	—	—	—
Dells Pulp & Paper Co.	12,000	—	—	—	—	—
Escanaba Paper Co. ..	170,000	—	—	—	—	—
Finch, Pruyn & Co. ..	44,000	10,000	—	—	—	—
Flambeau Paper Co. .	14,000	—	—	—	—	—
Gary Paper Mills, Inc.	—	—	10,000	—	—	—
Gilman Paper Co.	17,000	—	—	—	—	—
Gould Paper Co.	17,000	—	—	—	—	—
Grandfather Falls Co.	11,000	—	—	—	—	—
Great Northern Paper Co.	257,000	300,000	375,000	520,000	570,000	560,000
Great Western Paper Co.	20,000	—	—	—	—	—
Hennepin Paper Co. .	12,000	—	—	—	—	—
High Falls Pulp & Paper	8,000	—	—	—	—	—
Inland Empire Paper Co.	29,000	—	20,000	22,000	23,000	23,000
International Paper Co.	323,000	—	—	25,000†	238,000	240,000
Maine Seaboard Paper Co.	—	104,000	—	—	—	—
Manistique Pulp & Paper	20,000	—	25,000	8,000	8,000	12,000
Minn. & Ontario Paper Co.	76,000	—	—	—	—	—
Neekoosa-Edwards Paper	10,000	—	—	—	—	—
Northwest Paper Co. .	14,000	—	—	—	—	—
Oswegatchi Paper Co.	16,000	—	—	—	—	—
Oswego Falls Corp. ..	11,000	—	—	—	—	—
Pejepscot Paper Co. ..	41,000	—	35,000	35,000	10,000	7,000
Publishers Paper Co. .	9,000	56,000	80,000	100,000	125,000	125,000
St. Croix Paper Co. ..	55,000	75,000	90,000	100,000	150,000	150,000
St. George Paper Co. .	10,000	—	—	—	—	—
St. Lawrence Paper Co.*	—	—	30,000	25,000	14,000	—
St. Regis Paper Co. ..	115,000	—	—	—	—	—
Sherman Paper Co. ..	16,000	—	—	—	—	—
Southland Paper Mills	—	55,000	135,000	175,000	290,000	290,000
Tidewater Paper Mills	32,000	—	—	—	—	—
Watab Paper Co.	17,000	—	—	—	—	—
Waterway Paper Prod. Co.	14,000	—	—	—	—	—
West End Paper Co. .	13,000	—	—	—	—	—
West Tacoma Newsprint Co.	—	—	25,000	60,000	68,000	68,000
Wisconsin River Paper & Pulp	25,000	—	—	—	—	—
TOTAL	1,739,000	820,000	1,150,000	1,630,000	2,389,000	2,395,000

**Former St. Regis mill at Norfolk, N. Y.*
†Mobile, Ala.

Hardboard: Record Output, More Problems

Hardboard production and consumption in the U.S. reached an all-time high last year. Sizeable increases occurred during 1959, but hardboard imports experienced a lusty 84% expansion over the previous year, according to Hardboard Assn. statistics. Domestic production in 1959 increased to 2.154 billion sq. ft. (⅛-in. basis), 31% over 1958; consumption was up 64% to 2.421 billion sq. ft.

Currently, according to F. M. Hughes, Hardboard Assn. president and mgr. of Forest Fibre Products Co., Forest Grove, Ore., about half the production is used in new home construction or remodeling. Other major uses include furniture and automobile production, commercial and industrial construction.

Significant Application Change

Production of panels with smooth, dent-resistant surfaces (including graining of exotic and native woods) has been the significant factor in moving application from the out-of-sight category to the decorative, finish uses.

The hardboard industry's problems are, like production, tending to increase. According to Mr. Hughes, some of the confronting issues "are the natural result of expanding production and the burgeoning market, which we ourselves are creating." He says this industry "must adopt increasingly complex and specialized methods. Intense competition is putting a tighter strain on the manufacturer's activity, from new product research to the field sales force. Other challenges, such as the foreign import problem and the corresponding decline of U.S. hardboard exports, are not of our making."

To be competitive, production facilities must be completely modern and geared to maximum efficiency, says Mr. Hughes. "For an average size new plant designed to produce 100,000,000 sq. ft. annually, capital investment of $5,000,000 to $7,000,000 may be required. To provide such a plant with a steady source of raw material, another major investment of from $15,000,000 to $20,000,000 may be needed for a timber reserve; providing, of course, an adequate timber stand is available and transportation costs are not prohibitive. Labor, transportation, disposal of waste materials and other factors add to the mounting costs of new facilities.

"Apart from the major investment required for manufacturing plants and related equipment and services, operating costs in all phases of the industry are on the upturn. Cost of sales and distribution now account for between 10 and 25% of the unit price on most hardboard products, a ratio that has climbed considerably in recent years."

Hardboard Industry Predictions:

1. Domestic hardboard production will expand to 4 billion sq. ft. by 1970.
2. Imports, especially from Scandinavian countries, will continue to increase—conceivably capturing 35% of the domestic market by 1970.
3. Greater competition will demand increased emphasis on development of new products, new applications, new markets.
4. Import price threat must be combatted by more pre-sale and post-sale consumer services and assistance, as well as by product quality.
5. Promotional efforts by individual manufacturers and the industry will assume larger proportions.

U.S. HARDBOARD PRODUCTION, CONSUMPTION, IMPORTS

(M sq. ft., ⅛-in. bases)

	Production	% Incr. Fr. Prev. Yr.	Consumption	% Incr. Fr. Prev. Yr.	Imports	% Incr. Fr. Prev. Yr.
1950	950,899	—	945,469	—	14,750	—
1955	1,412,154	—	1,501,070	—	105,815	—
1956	1,439,949	2	1,571,912	5	149,923	41
1957	1,516,058	5	1,660,151	6	161,940	8
1958	1,640,000	8	1,776,590	7	153,077	5
1959	2,154,666	31	2,420,952	36	281,571	84

Source: Hardboard Assn.

UNITED STATES—HARDBOARD AND INSULATION BOARD PRODUCTION

In M sq. ft.—⅛ in. basis for hardboard; ½ in. basis for insulation board.

	Hardboard[1]	Insulation[2] Board
1951	835,000	2,341,000
1952	953,000	2,297,000
1953	1,226,000	2,500,000
1954	1,267,000	2,650,000
1955	1,451,000	2,968,000
1956	1,480,000	2,993,000
1957	1,560,000	2,699,000
1958 (prelim.)	1,639,000	2,803,000
1959	2,213,000	2,963,156

Source U.S. Census Bureau data in short tons (converted to M sq. ft. by following factors: Hardboard 2.74, Insulation Board 2.716).
[1] Density over 26 lbs. per cu. ft. Includes only hard pressed boards made from woodpulp, does not include chip, flake or particle boards made from unpulped chips, shavings or other wood waste.
[2] Density 26 lbs. or less per cu. ft.

PRODUCTION OF HARDBOARD BY COUNTRIES

(Figures given in thousands of metric tons; suggested formula for converting to square feet basis 1 metic ton=2939 sq. ft.)

	1951	1957	1958
United States	312	516	543
Sweden	254	430	472
Germany (West	88	89	90
Australia	26	91	98
Canada	59	72	75
Norway	46	62	62
Finland	54	73	86
France	39	78	95
Belgium	24	43	46
USSR		56	67
Italy	33	34	32
Czechoslovakia		23	26
Germany (East)		32	35
Poland		36	40
So. Africa		na	na
United Kingdom	14	25	27
Austria	14	34	36
New Zealand	8	12	16
Argentine		na	18
Mexico		na	14
Spain		11	8
Japan	9	23	42
Ireland		11	14
World Totals	990	1940	2110

(Includes other minor producers not shown above)
Source: UN-FAO

PRODUCTION OF PARTICLE BOARD BY COUNTRIES

(in 1000 metric tons)

	1957	1958
West Germany	234	285
United States	212	na
France	55	72
Britain	34	36
Italy	26	25
Austria	23	na
East Germany	23	na
Canada	14	14
Netherlands	na	25
Japan	15	19
Denmark	na	na
Belg-Lux'b'rg	8	na
Finland	7	18
Czechoslovakia	6	9.2
Turkey	4	na
Spain	3	3
Sweden	4	na
Mexico	na	na
Brazil	28	36
Colombia	2	na
Uruguay	na	0.8

BY CONTINENTS

Europe	465	555
North America	225	225
Latin America	30	40
Africa	60	60
Asia	20	25
World Totals*	800	905

*Includes other minor producers not shown above
Source: UN-FAO; U.S. Dept. of Commerce

U.S. Pulp and Paper Industry Statistics

U.S. INDUSTRY GROWTH

(in Millions of Units)

	Pulpwood Consumption	Woodpulp Production	Woodpulp Consumption	Waste paper Consumption
1939	10.8 cords	7.0 tons	8.7 tons	4.4 tons
1950	23.7	14.8	16.5	7.9
1952	26.4	16.5	17.3	7.9
1953	28.1	17.5	18.7	8.8
1954	29.2	18.3	19.0	8.1
1955	30.9	20.8	22.4	10.2
1956	33.8	22.1	22.9	8.9
1957	35.7	21.8	23.3	8.4
1958	35.2	21.7	23.3	8.6
1959	38.7	24.1	25.1	9.1

	Paper & board Production	Woodpulp Imports	Newsprint Imports
1939	13.5 tons	2.0 tons	2.6 tons
1950	24.3	2.4	4.9
1952	24.4	1.9	5.0
1953	26.6	2.2	5.0
1954	26.9	2.1	5.0
1955	30.2	2.2	5.2
1956	31.4	2.3	5.6
1957	30.7	1.8	5.2
1958	30.7	2.1	4.8
1959	34.0	2.4	5.2

U.S. PULP & PAPER INDUSTRY

Number of Companies and Mills

	Co's	—Mills— Paper	Pulp
1946	517	735	242
1947	560	758	241
1948	570	768	245
1949	565	764	255
1950	572	767	259
1951	530	769	278
1952	490	768	303
1953	483	772	299
1954	482	775	319
1955	495	788	326
1956	493	804	330
1957	494	795	338
1958	495	815	347
1959	496	816	365

U.S.A.

ANNUAL WOODPULP CAPACITY

(in short tons)

1934	7,006,310
1939	9,087,030
1946	12,310,164
1949	15,017,813
1952	18,771,390
1955	22,407,489
1957	27,170,000
1958	28,282,000
1959	28,846,000
1960	29,615,000

BASIC U.S. PRODUCTION AND CONSUMPTION DATA

	PAPER Production (tons)	PAPER Consumption (tons)	WOODPULP Production (tons)	WOODPULP Consumption For Paper Only (tons)	WOODPULP Consumption All Purposes (paper, rayon, cellophane, film, plastics, etc.,—tons)	PULPWOOD Consumption (cords)
1899	2,167,593	2,158,000	1,179,525	1,216,254	.....	1,986,310
1909	4,216,708	4,224,000	2,495,523	2,856,593	.....	4,001,607
1919	6,190,361	6,479,490	3,517,952	4,113,911	.....	5,477,832
1929	11,140,235	13,347,925	4,862,885	6,704,341	.....	7,645,011
1934	9,186,266	11,185,682	4,436,128	5,969,633	.....	6,796,659
1938	11,327,000	13,488,300	5,933,560	7,975,000	.....	9,193,991
1942	17,083,862	19,608,862	10,783,430	11,038,020	.....	17,204,000
1946	19,277,667	22,509,788	10,605,225	12,092,093	12,605,093	17,817,560
1948	21,897,301	26,082,093	12,872,292	14,374,586	15,034,586	21,189,458
1949	20,315,436	24,694,482	12,171,786	13,606,387	14,181,387	19,949,440
1950	24,375,468	29,012,144	14,810,860	16,483,201	17,183,201	23,627,000
1951	26,046,697	30,562,484	16,494,000	17,704,000	18,480,000	26,576,000
1952	24,418,383	29,106,854	16,472,979	17,274,000	18,041,008	26,476,110
1953	26,604,583	31,360,104	17,537,295	18,681,713	19,480,837	28,150,003
1954	26,876,242	31,379,024	18,341,175	19,033,994	19,900,794	29,201,000
1955	30,153,596	34,694,537	20,739,696	21,453,766	21,484,000	33,332,000
1956	31,428,155	36,477,976	22,117,998	22,945,491	23,867,391	35,752,000
1957	30,700,008	35,296,722	21,789,071	22,540,735	23,617,406	35,452,000
1958	30,797,000	35,299,837	21,734,000	22,505,000	23,347,000	34,761,462
1959	34,051,000	38,767,378	24,257,000	25,157,000	26,087,284	38,943,000

Source: American Paper and Pulp Assn.; U. S. Census Bureau; U. S. Pulp Producers Assn.

U.S. PAPER PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION

(All Grades—in tons of 2,000 lbs.)

Year	Production	Imports**	Exports**	Consumption Tons	Consumption Lbs/Capita
1899	2,167,593	.....	.....	2,167,593	57.9
1909	4,121,495	55,962	74,764	4,102,693	90.5
1919	5,966,076	707,548	420,540	6,253,084	119.1
1929	11,140,235	2,533,603	262,383	13,411,455	220.3
1939	13,509,642	2,687,484	248,569	15,948,557	243.7
1942	17,083,862	3,038,499	341,920	19,780.441	293.8
1945	17,370,965	2,753,211	458,689	19,665,487	281.7
1948	21,897,301	4,581,811	397,019	26,082,093	355.9
1949	20,315,436	5,751,323	372,277	24,694,482	331.0
1950	24,375,468	5,008,222	371,546	29,012,144	382.4
1951	26,046,697	5,151,090	635,303	30,562,484	395.7
1952	24,418,383	5,190,859	592,388	29,106,854	369.7
1953	26,604,583	5,230,866	475,345	31,360,104	393.0
1954	26,876,242	5,189,880	687,098	31,379,024	386.4
1955	30,153,596	5,386,174	845,233	34,694,537	419.8
1956	31,428,155	5,836,030	786,209	36,477,976	434.1
1957	30,700,008	5,466,427	869,713	35,276,262	412.4
1958	30,797,000	5,330,625	841,633	35,285,992	405.4
1959	34,051,000	5,610,628	894,450	38,767,378	437.8

**Quantities estimated, wholly or in part, from values given. Imports and exports for various grades include 'Paper Products.'

Source—U. S. Census Bureau; APPA

TOTAL PAPER PRODUCTION IN UNITED STATES BY GRADES

(Tons of 2,000 lbs.)

Year	Newsprint	Book	Groundwood	Fine	Wrapping (Coarse)	Tissue	Sanitary	Absorbent	Building Paper	Other Paper	Total All Paper	Total Paper and Board
1899	569,121	304,459	*	131,456	535,252	28,406	*	*	*	*204,697	1,773,482	2,167,593
1924	1,481,425	1,050,000	*	422,000	1,235,000	242,000	*	.....	*	*649,560	5,079,985	7,929,985
1940	1,056,304	1,655,423	550,453	735,753	2,500,818	733,894	.....	129,410	682,460	60,120	8,104,635	14,483,709
1945	725,475	1,501,015	636,026	1,000,794	2,403,182	157,083	823,705	88,643	883,259	238,047	8,457,229	17,370,955
1950	1,013,346	3,302,861		1,198,574	3,285,635	225,199	1,148,351	126,690	1,424,633	340,903	12,063,942	24,375,468
1951	1,108,165	3,514,061		1,366,425	3,627,072	270,138	1,215,258	124,412	1,385,691	419,036	13,010,418	26,046,697
1952	1,108,723	3,385,179		1,296,020	3,237,885	209,000	1,148,000	118,000	1,298,799	396,698	12,197,165	24,418,383
1953	1,068,661	3,576,338		1,298,675	3,397,782	231,166	1,277,494	127,644	1,317,253	538,249	12,739,744	26,604,583
1954	1,202,413	3,587,360		1,284,526	3,461,611	226,342	1,385,895	†	1,428,349	500,525	13,077,821	26,876,242
1955	1,459,017	3,937,228		1,449,554	3,680,368	240,060	1,520,976		1,586,098	609,852	14,485,153	30,153,596
1956	1,620,146	4,303,729		1,569,564	3,946,578	238,839	1,615,022		1,429,021	682,504	15,405,402	31,428,155
1957	1,804,025	4,027,520		1,544,774	3,667,832	254,406	1,662,384		1,285,561	634,027	14,880,529	30,700,008
1958	1,723,000	4,031,000		1,568,000	3,631,000	227,000	1,734,000		1,349,000	611,000	14,874,000	30,797,000
1959	1,920,000	4,525,000		1,706,000	3,943,000	237,000	1,846,000		1,382,000	746,000	16,305,000	34,051,000

** In 1899 and 1924 groundwood, absorbent, sanitary and building papers are included in "Other Paper." Beginning in 1948, groundwork included with book.*
† Absorbent included in "Other Paper."

Source: U.S. Census Bureau

TOTAL UNITED STATES PRODUCTION OF WOODPULP

(Tons of 2000 pounds)

Production	Dissolving & Special Alpha	Sulphite Paper Grades Bleached	Sulphite Paper Grades Unbleached	Sulphate Paper Grades Bleached	Sulphate Paper Grades Semibleached	Sulphate Paper Grades Unbleached	Soda
1937	353,640	995,029	791,575	—215,150—		1,923,937	507,548
1940	326,729*	1,285,360*	995,700	453,282	131,332	3,163,378	532,387
1946	316,573*	1,375,504*	784,391	749,822	152,337	3,685,857	476,211
1947	407,387	1,494,558	894,017	908,911	193,156	4,254,643	491,580
1948	419,683	1,489,719	901,814	1,040,055	224,751	4,748,890	509,864
1949	374,050	1,454,971	707,263	1,118,282	263,637	4,595,362	492,194
1950	478,849	1,628,692	740,895	1,432,945	359,917	5,708,567	522,221
1951	616,202	1,760,685	764,640	1,899,014	293,584	6,379,172	446,260
1952	706,033	1,691,523	673,453	2,082,844	275,062	6,210,798	425,415
1953	677,326	1,728,648	593,958	2,389,212	302,931	6,752,673	427,546
1954	784,883	1,816,389	587,675	2,683,021	328,667	6,800,366	429,596
1955	983,444	1,909,006	646,423	3,202,071	422,629	7,664,644	440,454
1956	940,945	2,002,065	684,339	3,658,935	488,478	7,983,398	478,624
1957	1,010,904	1,957,471	617,908	3,720,622	563,085	7,650,926	428,120
1958	929,125	1,849,206	532,255	4,067,371	601,978	7,647,099	429,167
1959	1,092,000	1,908,000	539,000	4,568,000	690,000	8,522,000	480,000

	Total Chemical	Groundwood	Other Non-Chemical	Semichemical	Screenings	All Grades
1937	4,786,879	—1,600,667—		132,521	52,851	6,572,918
1940	6,888,168	1,632,727	210,148	164,940*	63,576*	8,959,559
1946	7,540,695	1,951,456	616,257	319,842*	178,277*	10,606,527
1947	8,644,252	2,049,814	693,282	444,033	114,483	11,945,864
1948	9,334,776	2,175,107	744,671	477,861	139,877	12,872,292
1949	9,005,759	1,960,496	604,010	506,226	130,788	12,207,279
1950	10,872,086	2,215,883	934,666	685,906	140,410	14,848,951
1951	12,159,557	2,473,796	944,776	796,546	149,733	16,524,408
1952	12,065,128	2,321,124	1,117,904	828,917	139,906	16,472,979
1953	12,872,294	2,342,931	1,153,009	1,028,721	140,342	17,537,297
1954	13,430,597	2,484,963	1,027,525	1,197,984	161,204	18,302,273
1955	15,268,671	2,728,870	1,190,081	1,407,654	144,420	20,739,696
1956	16,236,784	3,041,012	1,171,201	1,546,714	135,238	22,130,949
1957	15,949,036	3,088,700	1,059,474	1,582,637	120,362	21,800,209
1958	16,056,201	2,889,879	1,132,898	1,622,028	94,646	21,795,652
1959	17,999,000	3,187,000	1,265,000	1,906,000	100,000	24,257,000

* Estimated from U.S. Bureau of Census combined data.
Source: United States Bureau of the Census and U. S. Pulp Producers Assn. Inc.

U.S. WOODPULP IMPORTS FROM EUROPE

(Short Tons)

	Sweden	Finland	Norway	Austria	Czech.	France	Ger.	Switz.	Total**
1945*	672,261	0	0	0	0	0	0	0	672,261
1946	445,114	115,220	0	0	0	0	0	0	560,334
1947	555,215	223,973	9,577	0	0	0	0	0	793,693
1948	384,576	175,900	13,218	1,696	0	0	0	0	575,390
1949	265,621	148,903	29,208	4,459	1,027	0	0	0	449,218
1950	398,814	205,651	28,958	21,005	2,597	115	977	89	668,146
1952	189,613	145,630	21,168	2,430	0	124	169	0	359,138
1953	334,813	160,216	36,777	9,996	0	211	588	0	542,601
1954	224,471	132,792	14,997	0	0	50	0	0	372,310
1955	189,845	144,982	13,696	0	0	55	0	0	348,578
1956	213,332	153,618	9,335	554	0	0	0	0	376,879
1957	163,313	97,168	5,985	0	0	0	0	0	266,287
1958	183,589	84,466	28,995	0	0	0	0	0	297,060
1959	281,485	128,815	28,813	0	0	73	1,615	0	439,370

* The 1945 figure is for only 6 mos., when shipping reopened after the war.
** Includes 167 tons from Italy in 1950; 4,928 tons from Russia in 1947 and 9,773 tons from Russia in 1950; 4 tons from Australia in 1952; 12 tons from Italy and 28 tons from the Netherlands in 1956. Also, 1,896 tons from U.S.S.R., 110 tons from Latvia, 12,359 tons from U. of South Africa.

TYPICAL PULP PRICES IN THE UNITED STATES
(Prepared especially by PULP & PAPER)

Before World War II—Under OPA Regulation (1944 and 1946 allowed increases are shown)—and in recent years. Specially prepared authentic table for this WORLD REVIEW.
Swedish and Norwegian prices are N. Y. *Dock* prices; U. S. and Canadian are *"Delivered"* and Maximum Freight Allowances are noted.

	Domestic Bleached Kraft	Canadian Bleached Kraft	Swedish Unbl'ched Kraft	Swedish Bleached Sulfite	Domestic Bleached Sulfite	Canadian Bleached Sulfite	Norway Bleached Sulfite	Canadian Unbl'ched Sulfite	Swedish Unbl'ched Sulfite
1939	—	—	$28	$43	$50	—	—	—	$36
1944	—	—	$69	$82	$86	$86	—	$75	$70
1946	—	—	$79	$91	$94	$94	—	$82	$79
Apr. 1949	$136	$136	$112	$132	$126	$130	$125	$118	$122
June 1951	$135 to $200 (1)	$195 (2)	$225	$250 to $290	$135 to $165	$160 (2) to $175 (2)	$250	—	$225 to $265
May 1953	$140 to $147.50	$145 to $155	$100 to $125	$130 to $135	$140	$140 to $145	$140 to $145	$130 to $135	$110 to $125
May 1954	$140 to $147.50	$145 to $150	$105 to $110	$135 to $140	$140	$140	$135 to $142.50	$120	$115 to $122
July 1955	$150	$150	$110 to $115	$142.50 to $145	$145	$145	$140 to $142.50	$125	$125 to $128
July 1956	$152 to $155	$152 to $155	$125	$150 to $155	$150	$150	$150 to $155	$130	$130
July 1957	$155	$155	$130	$145	$150	$150	$150 to $155	$130	$130
July 1958	$157 to $160	$157 to $160	$110 to $115	$140 to $145	$155	$155	$110 to $115	$130	$120 to $125
July 1959	$157 to $160	$157 to $160	$110 to $115	$140 to $145	$155	$155	$125	$135	$117.50 to $120
July 1960	$152 to $160	$157 to $160	$105 to $115	$155	$150 to $155	$150 to $155	$155	$135	$117 to $120

Maximum Freight Allowances:
(1) $12.50 (2) $7.50 (3) $18.50 (4) $15.00.

U.S. WOODPULP EXPORTS

	Tons	Value
1930	48,426	$ 2,070,553
1935	171,710	$ 8,632,971
1939	139,504	$ 6,493,140
1940	480,938	$29,736,737
1943	300,700	$20,288,879
1946	39,361	$ 3,645,963
1949	122,133	$14,082,575
1950	95,693	$12,056,311
1953	161,687	$22,793,371
1954	441,863	$62,337,237
1955	632,914	$87,491,601
1956	530,682	$81,330,276
1957	628,721	$95,829,046
1958	515,859	$77,867,947
1959	652,437	$94,839,931

Source: U. S. Department of Commerce and U. S. Pulp Producers Assn.

U.S. PULP IMPORTS

Year	Chemical Tons	Value (in thous. of dollars)	Mechanical Tons	Value (in thous. of dollars)
1925	1,332,522	$ 73,317	331,092	$ 8,517
1930	1,530,985	$ 73,962	299,256	$ 7,146
1936	2,049,722	$ 78,785	227,778	$ 4,051
1940	1,053,057	$ 55,474	170,909	$ 4,712
1945	1,526,647	$106,858	227,418	$ 8,936
1947	2,016,153	$238,126	290,514	$ 18,032
1949	1,554,320	$168,910	208,782	$ 12,099
1950	2,098,667	$224,358	286,308	$ 15,802
1951	2,046,311	$324,280	321,178	$ 26,414
1953	1,894,216	$244,670	263,630	$ 18,445
1954	1,807,897	$251,595	242,865	$ 17,593
1955	1,958,422	$253,729	254,524	$ 18,620
1956	2,048,380	$276,504	270,916	$ 20,315
1957	1,862,076	$251,229	228,747	$ 16,981
1958	1,891,233	$261,154	199,110	$ 14,603
1959	2,202,557	$298,392	229,472	$16,302,879

Source: U. S. Pulp Producers Assn., U. S. Dept. of Commerce.

U.S. PULPWOOD STATISTICS
Receipts—Consumption—Inventories

(In Thousands of Cords)

Year	Receipts Domestic	Receipts Imp'ts	Receipts Total	Consum.	Yr. End Invent.
1941	14,177	2,281	16,458	16,580	3,729
1943	13,581	1,712	15,293	15,645	2,846
1945	15,254	1,729	16,983	16,912	2,627
1947	18,529	2,084	20,613	19,714	4,563
1949	17,547	1,706	19,252	19,916	4,877
1950	20,712	1,834	22,546	23,627	3,615
1951	25,128	2,650	27,778	26,522	5,072
1952	25,045	2,315	27,358	26,462	5,949
1953	26,339	1,548	27,887	28,150	5,650
1954	26,973	1,624	28,597	29,201	5,058
1955	30,894	1,928	32,822	33,332	4,745
1956	35,196	1,973	37,169	35,852	6,229
1957	33,942	1,841	35,783	35,452	6,629
1958	34,133	1,822	35,955	34,761	5,953
1959	36,842	1,345	38,187	38,942	5,203

Source: Bureau of the Census; except 1941-1943, by War Production Board; 1951-52—NPA, Pulp, Paper & Board Div.

U.S. NEWSPRINT CONSUMPTION

	Population	Newprint Tons	Paper Used Per Capita Lbs.
1924	113,090,000	2,737,000	48.4
1930	123,091,000	3,563,000	57.9
1935	127,521,000	3,300,900	51.7
1940	132,817,000	3,730,000	56.2
1945	139,621,000	3,480,000	49.8
1947	143,382,000	4,753,000	66.3
1948	146,116,000	5,141,000	70.4
1949	149,215,000	5,520,000	74.1
1950	151,376,000	5,937,000	78.4
1952	155,300,000	5,988,000	77.2
1953	160,873,000	6,143,000	76.9
1954	162,400,000	6,150,000	75.8
1955	167,181,000	6,638,000	80.8
1956	170,700,000	6,899,000	80.8
1957	172,100,000	6,820,000	79.3
1958	173,888,000	6,674,307	76.8
1959	179,017,000	7,056,897	79.7

U.S.—ALL PAPER OTHER THAN PAPERBOARDS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Tons	Consumption Lbs. per Capita
1899	1,773	....	...	1,773	47
1914	3,860	349	106	4,103	84
1924	5,079	1,445	100	6,424	113
1934	5,173	2,252	114	7,311	116
1941	9,362	3,086	317	12,131	182
1947	10,705	4,060	297	14,468	201
1950	12,064	4,921	233	16,752	221
1951	13,010	5,037	357	17,691	229.2
1952	12,197	5,106	391	16,912	215.4
1953	12,739	5,106	247	17,599	220.5
1954	13,077	5,090	388	17,780	219.0
1955	14,483	5,273	486	19,270	233.2
1956	15,405	5,717	409	20,713	246.4
1957	14,881	5,348	461	19,768	230.9
1958	14,874	5,214	419	19,668	226.0
1959	16,305	5,440	408	21,337	241.0

Source: APPA, Census Bureau.

U.S.—ALL OTHER PAPER

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Lbs. per Capita
1899	53	..	..	53	1.4
1914	107	46	37	116	2.3
1924	129	31	40	120	2.1
1934	298	14	22	290	4.6
1943	296	3	15	283	4.2
1947	389	3	38	354	4.9
1950	460	5	15	451	5.9
1951	540	9	21	528	6.8
1952	517	11	26	502	6.4
1953	554	16	31	540	6.8
1954	501	16	35	481	5.9
1955	610	20	44	585	7.1
1956	683	28	48	662	8.0
1957	634	26	50	610	7.1
1958	611	27	52	585	6.7
1959	746	32	58	719	8.2

Source: APPA.—Up to 1948, included groundwood. Since then, groundwood included in book.

U.S.—NEWSPRINT

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Tons	Consumption Lbs. per Capita
1899	569	....	...	569	15
1914	1,313	278	44	1,547	32
1924	1,481	1,357	17	2,821	50
1934	989	2,209	23	3,175	50
1941	1,043	2,982	70	3,956	60
1947	833	3,957	28	4,762	66
1950	1,013	4,863	44	5,832	76.9
1951	1,109	4,963	71	5,999	77.7
1952	1,109	5,033	105	6,037	76.9
1953	1,069	5,004	47	6,026	75.5
1954	1,202	4,992	140	6,054	74.6
1955	1,459	5,159	207	6,411	77.6
1956	1,620	5,570	152	7,037	83.7
1957	1,804	5,223	173	6,854	80.0
1958	1,723	5,078	127	6,674	76.8
1959	1,920	5,262	125	7,056	79.7

Source: Census Bureau, APPA.

U.S. BOARD PRODUCTION

(In Thousands of Tons)

	Paper-board*	Wet Machine Board**	Building Board
1946	8,396	138	956
1949	8,992	125	839
1950	10,926	165	1,221
1952	10,772	140	1,309
1954	12,191	136	1,473
1955	13,869	179	1,622
1956	14,234	147	1,642
1957	14,081	155	1,584
1958	14,151	142	1,630
1959	15,704	143	1,899

**Container boards, box boards, cardboard and other.*
***Shoe board, binder board and other.*
Source: U. S. Department of Commerce

U.S. FINE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Lbs. per Capita
1899	131	..	..	131	3
1914	269	..	3	266	5
1924	422	1.3	4	419	7
1934	434	.8	10	425	7
1941	950	2	46	903	14
1947	1,171	.6	68	1,103	15
1950	1,197	1.4	43	1,156	15.2
1951	1,366	1.6	54	1,314	17.0
1952	1,296	1.7	47	1,251	15.9
1953	1,299	3.6	40	1,262	15.8
1954	1,285	2.6	47	1,240	15.3
1955	1,450	2.6	47	1,405	17.0
1956	1,570	2.7	39	1,534	18.2
1957	1,545	4.2	45	1,504	17.6
1958	1,546	6.0	38	1,513	17.5
1959	1,706	8.5	38	1,677	19.0

From 1899 to 1940 inclusive, only writing and cover were in fine papers. Beginning 1941, text papers (from book), bristol (from paperboard), and "thin papers" (from tissue) have been added.
Source: APPA, Census Bureau.

U.S. COARSE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Lbs. per Capita
1899	535	..	...	535	14
1914	911	18	7	922	18.8
1924	1,235	25	18	1,242	22
1934	1,356	5	32	1,329	21
1943	2,262	1	49	2,213	32
1947	2,903	22	51	2,874	40
1949	2,758	6	56	2,708	36
1950	3,297	11	83	3,225	42.5
1951	3,623	11	127	3,507	45.4
1952	3,234	11	122	3,123	39.8
1953	3,385	36	73	3,347	41.9
1954	3,462	36	93	3,405	41.9
1955	3,680	40	103	3,677	43.8
1956	3,947	49	89	3,906	46.5
1957	3,668	44	108	3,604	42.1
1958	3,612	54	110	3,555	40.9
1959	3,943	80	88	3,935	44.4

Source: APPA, Census Bureau

U.S. NEWSPRINT SUPPLY AND SOURCES

	In thousands of short tons from Canada	from U.S.A.	from Europe	Total	Percentages from Canada	from U.S.A.	from Europe
1915	367	1,184	1	1,552	24	76	0
1925	1,315	1,507	133	2,955	45	51	4
1930	2,145	1,272	134	3,551	60	36	4
1935	2,122	911	197	3,230	66	28	6
1940	2,741	998	34	3,773	73	26	1
1945	2,666	707	nil	3,373	79	21	0
1949	4,380	884	255	5,519	79	16	5
1952	4,855	1,065	190	6,110	79	18	3
1953	4,861	1,037	164	6,062	80	17	3
1954	4,875	1,085	140	6,100	80	18	2
1955	5,025	1,270	125	6,420	78	20	2
1956	5,230	1,582	311	7,123	73	22	4
1957	5,055	1,698	155	6,908	73	25	2
1958	4,826	1,675	108	6,611	73	25	2
1959	5,117	1,909	128	7,155	71	27	2

U.S. PRINTING PAPERS (including Book and Groundwood)

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumption Tons	Lbs. per Capita
1899	304	..	..	304	8
1914	795	6	14	788	16
1924	1,050	14	10	1,053	18
1934	1,055	4	12	1,047	16
1941	2,025	28	51	2,002	30
Beginning 1941, text papers allocated to fine papers.					
1947	2,207	74	76	2,206	31
Beginning 1948 Groundwood Papers included with Book Paper. Groundwood was in All Other Paper					
1950	3,305	38	27	3,316	43.7
1951	3,514	51	52	3,512	45.5
1952	3,385	48	66	3,367	42.9
1953	3,556	43	27	3,572	44.8
1954	3,587	40	41	3,587	44.2
1955	3,937	46	50	3,933	47.6
1956	4,304	63	45	4,322	51.4
1957	4,028	47	47	4,028	47.1
1958	4,052	46	52	4,046	46.5
1959	4,525	54	56	4,522	51.0

Source: APPA, Census Bureau

United States WOODPULP PRODUCTION—1958 Vs. 1959

	Total Woodpulp, All Grades 1958	1959	% Change	Market Woodpulp, All Grades 1958	1959	% Change
Capacity	28,282,000	28,846,156	+ 2			
Production	21,795,652	24,257,000	+11	2,303,951	2,542,588	+10
Imports	2,101,787	2,431,433	+16	1,330,541	1,599,054	+20
Canada				1,048,055	1,143,732	+ 9
Europe				282,055	455,322	+61
Exports	505,917	601,149	+19	505,917	601,149	+19
New Supply	23,391,522	26,087,284	+12	3,128,575	3,540,493	+13
Consumption						
paper and board	22,483,118	25,157,000	+12	2,577,489	2,700,258	+ 5
non-paper	1,108,404	930,284		551,086	840,235	
Inventory, Dec. 31	792,560	777,714	− 2	474,568	501,128	+ 6
at pulp mills	248,772	244,605	− 2	125,428	129,447	+ 3
at paper & board mills	543,788	533,019	− 2	349,140	371,681	+ 6

Source: U.S. Pulp Producers Assn.

U.S.—TISSUE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Lbs. per Capita
1899	28	..	..	28	1
1914	115	..	..	115	2
1924	242	6	4	244	4
1934	397	8	7	398	6
1941	912	.07	25	889	13
1947	1,088	1	18	1,071	15
1950	1,365	.5	13	1,353	17.8
1952	1,357	.3	18	1,339	17.1
1953	1,505	.7	21	1,485	18.6
1954	1,612	1.8	22	1,592	19.6
1955	1,761	1.1	24	1,738	21.0
1956	1,854	3.1	25	1,832	21.8
1957	1,917	2.1	26	1,893	22.1
1958	1,947	1.9	26	1,922	22.2
1959	2,083	2.2	26	2,058	23.2

Source: APPA, Census Bureau

PRESENT (IN USE) AND FUTURE WOODPULP RESOURCES—U.S.A.

Thousands of Tons, Bone Dry Weight

Area	Available			Utilized		
NORTHEAST	Coarse	Fine	Total	Coarse	Fine	Total
New England	800	600	1,400	700	400	1,100
Middle Atlantic (including W. Va.)	1,050	750	1,800	700	450	1,150
Total Northeast	1,850	1,350	3,200	1,400	850	2,250
SOUTH (Ala., Ark., Fla., Ga., La., Miss., N.C., S.C., Okla., Tenn., Tex., Va.)	10,042	7,769	17,811	1,465	°	°
CENTRAL STATES	1,093	656	1,749	..	..	120
LAKE STATES						
Minnesota	265	140	405	°	°	Small
Wisconsin	434	245	679	28	°	28
Michigan	490	280	770	°	°	Small
Total Lake States	1,189	665	1,854	35	250	285
ROCKY MOUNTAIN STATES						
Colorado	85	163	248	0	44	44
Wyoming	33	74	107	0	20	20
South Dakota	15	34	49	0	9	9
Nebraska	Nil	Nil	Nil	0	Nil	Nil
Arizona	84	127	211	0	34	34
New Mexico	39	63	102	0	17	17
Total Rocky Mountain States	256	461	717	0	123	123
INTERMOUNTAIN STATES						
Montana	180	278	458	111	139	250
Idaho	308	504	812	208	347	555
Utah-Nevada	49	68	117	8	10	18
Wyoming	47	46	93	11	7	18
Total Intermountain States	584	896	1,480	338	503	841
PACIFIC COAST						
Washington (East)	370	88	458	184	40	224
Washington (West)	460	264	724	465	107	572
Total Washington	830	352	1,182	649	147	796
Oregon (East)	438	519	957	346	457	803
Oregon (West)	2,900	3,000	5,900	1,425	1,627	3,855
Total Oregon	3,338	3,519	6,857	1,771	2,084	4,658
California	3,500	1,885	5,385	1,170	940	2,110
Total Pacific Coast	7,668	5,756	13,424	3,590	3,171	7,564
GRAND TOTAL U.S.	22,682	17,553	40,235			11,183

U.S. IMPORTS OF EUROPEAN WOODPULP BY GRADES

(Short Tons)

	Bleached Sulfite Paper Grades	Bleached Sulfite Non-Paper Grades	Unbl'ch'd Sulfite	Bleached Sulfate	Unbl'ch'd Sulfate	Groundwood	Total*
1946	27,541	12,417	207,059	23,484	260,434	29,399	560,334
1950	115,020	8,262	163,975	86,548	257,160	34,618	668,146
1952	59,774	3,317	125,623	70,568	72,103	27,529	359,138
1954	41,955	2,230	73,451	95,681	117,470[1]	37,328	372,310
1955	35,254	347	68,030	80,234	129,409[2]	32,106	348,578
1956	37,416	111	83,180	87,060	138,361[3]	23,525	376,879
1957	32,117	280	51,778	65,180	79,134[4]	11,610	266,287
1958	60,273	2,335**	56,254	70,979	63,326	12,202	282,486
1959	109,452	335	70,433	91,041	121,537	28,103	439,370

° Includes screenings and soda. [1] Includes 13,260 tons semi-bleached. [2] Includes 12,544 tons semi-bleached. [3] Includes 19,536 tons semi-bleached. [4] Includes 18,037 tons semi-bleached.

Source: Bureau of the Census.

** Union of South Africa

PULP PRODUCTION BY REGIONS (with figures as available for certain states)

1958

	Tons
Northeast	2,785,306
New England	1,775,289
Maine	1,409,584
Middle Atlantic	1,010,017
New York	516,524
New Jersey	83,082
Pennsylvania	410,411
North Central	2,344,388
East North Central	1,816,656
Ohio	120,190
Michigan	390,234
Wisconsin	1,180,726
West North Central	527,732
South	12,581,220
South Atlantic	7,502,338
Virginia	1,095,275
North Carolina	1,113,349
Georgia	2,138,848
Florida	2,102,162
East South Central	2,546,816
Alabama	1,127,630
West South Central	2,532,066
Louisiana	1,434,254
Texas	568,303
West	4,084,738
Washington	2,592,347°
Oregon	970,045

°Includes Alaska

AVERAGE HOURLY EARNINGS U.S. PULP AND PAPER INDUSTRY VS. U.S. FACTORY AVERAGE

	Pulp and paper Hourly Earnings	U.S. Factory Hourly Earnings
June 1933	$ .407	$ .398
June 1935	.538	.555
June 1937	.619	.634
June 1939	.626	.631
June 1941	.728	.732
June 1943	.855	.959
June 1945	.901	1.038
June 1947	1.232	1.244
June 1949	1.410	1.405
June 1950	1.466	1.453
June 1951	1.60	1.59
June 1952	1.68	1.65
June 1953	1.78	1.77
Dec. 1953	1.82	1.80
June 1954	1.83	1.81
Dec. 1954	1.88	1.83
Dec. 1955	1.99	1.93
Dec. 1956	2.13	2.05
Dec. 1957	2.22	2.10
Dec. 1958	2.29	2.19
Dec. 1959	2.38	2.27

Source: U.S. Bureau of Labor Statistics.

U.S. IMPORTS OF NORTH AMERICAN WOODPULP BY GRADES

(Short Tons)

Includes: Canada, Newfoundland, Labrador, Mexico

	Bleached Sulfite Paper Grades	Bleached Sulfite Non-Paper Grades	Unbleached Sulfite	Bleached Sulfate Paper Grades	Bleached Sulfate Non-Paper Grades	Semi-Bleached Sulfate	Unbleached Sulfate	Groundwood Bleached	Groundwood Unbleached	Groundwood Soda	Groundwood Screenings	Groundwood Total
1952	215,296	220,010	306,929	452,112		—	135,823	31,622	183,089	28,071	8,262	1,581,214
1953	234,079	254,232	254,322	470,502		—	154,580	57,298	145,391	34,883	8,378	1,613,665
1954	246,475	228,143	266,959	539,126		11,324	141,058	53,613	147,975	37,936	6,839	1,679,448
1955	338,918	214,525	290,850	556,366	9,816	29,746	165,171	40,795	178,244	41,260	8,846	1,864,721
1956	369,670	190,604	306,711	561,874	16,858	44,671	185,275	44,895	201,924	42,669	8,293	1,956,592
1957	351,802	126,727	228,891	593,363	10,740	62,447	199,331	31,506	183,710	36,955	7,193	1,832,665
1958	351,741	122,492	161,112	709,270	16,070	50,674	187,705	16,815	170,093	27,320	5,961	1,819,253
1959	328,938	161,073	121,185	802,629	11,607	90,510	237,396	16,855	179,860	27,630	5,584	1,983,267

Source: Bureau of the Census and U.S. Pulp Producers Assn.

U.S. PRICES OF DISSOLVING WOODPULP

Dollars Per Short Ton

		Standard		
		Regular Tenacity Viscose	*High Tenacity Viscose*	*Acetate & Cupra*
	1929	$ 97.00		
	1933	70.00		
Jan.	1938	97.50		100.00
Jan.	1946	107.50	112.50	117.50
Oct.	1949	150.00	161.00	171.00
Jan.	1951	185.00	195.00	225.00
May	1953	185.00	195.00	225.00
May	1954	185.00	195.00	225.00
July	1955	185.00	195.00	225.00
July	1956	185.00	195.00	225.00
July	1957	188.00	200.00	225.00
July	1958	185 to 188	195.00	205 to 225
July	1959	185 to 188	195.00	205 to 225
July,	1960	175	182.50 to 185	207 to 225

PRODUCTION WORKERS AND WAGES IN U.S. PULP, PAPER AND ALLIED PRODUCTS INDUSTRIES

Year	*Average number of wage earners (Thousands)*	*Total dollar wages (Millions)*
1899	94	36
1909	145	68
1919	203	208
1929	229	281
1939	265	310
1949	382	1,111
1951	420	1,436
1953	442	1,670
1954	439	1,690
1955	453	1,893
1956	463	2,147
1957	467	2,238
1958	439	2,027
1959	449	2,195

Source: U. S. Bureau of Labor Statistics. Source of data prior to 1939: Bureau of Census.

VALUE OF SALES IN U.S. INDUSTRY AND BY WHOLESALERS

Year	*By Pulp, Paper, Board and Products Industries Millions of dollars*	*By Wholesale Distributors of Paper and Its Products Millions of dollars*
1939	$ 1,785	$ 575
1941	2,836	739
1943	3,389	833
1945	3,725	909
1947	5,764	1,828
1949	5,468	1,723
1950	6,976	2,013
1951	8,439	2,400
1952	7,877	2,195
1953	8,381	2,587
1954	8,585	2,681
1955	9,891	3,490
1956	10,712	*
1957	10,765	*
1958	10,985	*
1959	12,169	*

* Series discontinued

Source: U. S. Dept. of Commerce.

U.S. WOODPULP CAPACITY

(Short tons)

	1959	*1960*	*1961*
Total	28,373,621	29,823,123	30,392,134
Dissolving & Spec. Alpha	1,324,694	1,467,184	1,467,184
Sulfite, Paper Grades	3,012,189	2,947,827	2,924,699
Bleached	2,368,532	2,317,346	2,294,218
Unbleached	643,657	630,481	630,481
Sulfate, Paper Grades	15,153,600	15,892,008	16,374,088
Bleached	5,176,551	5,042,651	5,097,406
Semibleached	640,890	1,071,089	1,071,089
Unbleached	9,336,159	9,778,268	10,205,593
Soda & Semichemical	2,823,028	3,359,773	3,449,662
Groundwood	4,284,577	4,269,699	4,289,869
Bleached	707,726	730,721	730,721
Unbleached	3,576,851	3,538,978	3,559,148
Defibrated & Exploded	1,709,735	1,825,313	1,825,313
Screenings	65,798	61,319	61,319

Source: U.S. Pulp Producers Assn., Inc.

SUMMARY OF FINANCIAL DATA OF PAPER AND ALLIED PRODUCTS

Year	*Total Assets*	*Net Worth*	*Net Sales*	*Net Profit Before Taxes*	*Federal Taxes*	*Net Profit After Taxes*	*Sales To Total Assets*	*Net Profit After Taxes To: Net Worth*	*Sales*
				(Millions)			*(Ratio)*	*(Percent)*	
1946	$3,264	$2,439	$ 4,223	$ 567	$212	$355	1.3	14.6	8.4
1947	3,992	2,901	5,530	909	339	570	1.4	19.7	10.3
1948	4,385	3,232	5,846	776	293	484	1.3	15.0	8.3
1949	4,504	3,405	5,303	551	213	339	1.2	10.0	6.4
1950	5,277	3,843	6,741	998	448	550	1.3	14.3	8.2
1951	6,278	4,331	8,199	1,318	792	526	1.3	12.1	6.4
1952	6,395	4,503	7,654	943	531	412	1.2	9.2	5.4
1953	6,669	4,735	8,160	930	510	420	1.2	8.9	5.1
1954	7,184	5,066	8,277	877	445	432	1.2	8.5	5.2
1955	8,129	5,623	9,543	1,105	547	559	1.2	9.9	5.9
1956	9,923	6,168	10,288	1,279	621	658	1.2	10.7	6.4
1957	9,368	6,363	10,537	985	490	495	1.1	7.8	4.7
1958	9,170	6,341	10,658	987	481	506	1.2	8.0	4.7

Source: 1946-1957: U.S. Treasury Department, Corporation Returns with Balance Sheets. 1958: Federal Trade Commission—Securities and Exchange Commission.

U.S. KRAFT, SEMICHEMICAL, OTHER PAPERBOARD PRODUCTION

YEARS	*Kraft paperboard Tons*	*Percent*	*Semichemical paperboard Tons*	*Percent*	*All other paperboard Tons*	*Percent*
Average 1926-29	134,300	3.6	24,025	.6	3,596,325	95.8
Average 1930-39	758,630	16.7	95,130	2.1	3,678,450	81.2
Average 1940-45	1,900,400	25.4	227,533	3.0	5,364,384	71.6
Average 1946-50	2,583,975	28.2	481,600	5.3	6,097,225	66.5
1951	4,115,200	34.6	853,000	7.2	6,923,000	58.2
1952	4,141,300	37.5	857,900	7.8	6,050,300	54.7
1953	4,829,200	38.5	1,056,000	8.4	6,659,000	53.1
1954	4,820,800	39.2	1,119,700	9.1	6,345,400	51.7
1955	5,661,900	40.3	1,366,200	9.7	7,012,500	50.0
1956	5,980,000	41.6	1,472,900	10.3	6,914,100	48.1
1957	5,977,700	42.1	1,490,700	10.5	6,715,400	47.4
1958	6,173,800	43.3	1,450,600	10.2	6,624,200	46.5
1959	7,133,000	44.7	1,775,600	11.1	7,061,400	44.2

Source: National Paperboard Assn.

U.S. WEEKLY EARNINGS— PAPER AND ALLIED PRODUCTS

Year	*No. of Production Workers (In Thous.)*	*(For Production Workers Only) Ave. Weekly Earnings*	*Ave. Weekly Hours*	*Ave. Hourly Earnings*
1947	406	$50.21	43.1	$1.16
1948	407	$55.25	42.8	$1.29
1949	389	$55.96	41.0	$1.34
1950	415	$61.14	43.3	$1.41
1951	434	$65.51	43.1	$1.52
1952	422	$68.91	42.8	$1.61
1953	444	$72.90	43.0	$1.69
1954	440	$74.01	42.3	$1.75
1955	453	$78.87	43.1	$1.83
1956	463	$83.03	42.8	$1.94
1957	459	$86.29	42.3	$2.04
1958	439	$88.83	41.9	$2.12
1959	449	$94.16	42.8	$2.20

Source: U.S. Bureau of Labor Statistics

WAGES AND INDUSTRY WORTH

(Pulp, Paper & Board)

Year	*Wage Earners*	*Wages Paid*	*Total Assets*
1849	6,785	$1,497,792	$7,260,864
1869	18,021	7,208,691	34,556,014
1889	31,050	13,204,828	89,829,548
1899	49,646	20,746,426	167,507,713
1909	75,978	40,804,502	409,348,505
1919	113,759	135,690,642	905,794,583
1929	128,049	173,077,781	1,250,000,000
1939	137,445	175,687,842	1,700,000,000
1949	198,000	614,000,000	3,200,000,000
1950	205,000	694,000,000	3,800,000,000
1952	219,000	839,000,000	4,500,000,000
1954	222,100	925,000,000	5,048,000,000E
1956	230,400	1,090,085,840	6,221,000,000E
1958	220,700	1,050,882,040	6,717,000,000E
1959	223,100	1,192,000,000	7,120,000,000E

Source: U.S. Census Bureau, APPA.

U.S. PRICES OF COTTON LINTERS PULP

Dollars Per Short Ton

	Annual Average	Low	High
1948	225.00	187.00	260.00
1950	337.00	187.00	546.00
1951	459.00	316.00	554.00
1952	288.00	223.00	316.00
1953	235.60	223.00	250.00
1954	210.00	210.00	210.00
1955	210.00	210.00	210.00
1956	215.00	206.00	220.00
1957	280.00		
1958	250.00		
1959	224.00 for sheets;		219.00 bulk
1960	250.00 for sheets;		245.00 bulk

USDA Regional Research Lab.

U.S. BUILDING BOARDS PRODUCTION

Year	Hard-board (over 26 lb. density)	Insulating board (under 26 lbs. density)	Total Tons
1941	254,477	362,033	616,510
1950	381,201	838,367	1,220,000
1952	435,154	879,655	1,314,809
1953	423,418	955,872	1,379,290
1954	464,868	1,007,653	1,472,521
1955	529,558	1,092,890	1,622,448
1956	539,981	1,102,012	1,641,993
1957	568,522	989,059	1,557,581
1958	615,000	1,031,000	1,646,000
1959	808,000	1,091,000	1,899,000

Source: U.S. Dept. of Commerce.

CONSUMPTION OF WASTE FIBROUS MATERIALS BY U.S. MILLS

(In Thousands of Tons)

	Waste Paper	Rags	Straw, Flax and Other	Total
1939	4,366	468	692	5,526
1944	6,859	428	957	8,245
1946	7,278	403	980	8,660
1948	7,649	425	1,075	9,149
1949	6,600	382	833	7,815
1950	7,956	442	998	9,395
1951	9,070	389	1,055	10,523
1952	7,881	325	871	9,007
1953	8,530	325	930	9,785
1954	8,064	317	895	9,276
1955	8,976	343	976	10,295
1956	8,860	300	883	10,124
1957	8,493		1,106	9,599
1958	8,670		1,003	9,674
1959	9,184		1,026	10,210

Source: Pulp and Paper Sec., Forest Products Div., Office of Domestic Commerce and NPA, Pulp, Paper, and Paperboard Div.

U.S. PAPERBOARD STATISTICS

(In Tons of 2,000 lbs.)

Year	Production	Imports	Exports	Consumption	Per Capita Consumption Lbs.
1899	394,111	.....	.....	394,111	10.5
1909	883,088	.....	.....	883,088	19.5
1919	1,867,064	44,461	61,890	1,849,635	35.2
1929	4,451,187	42,351	94,374	4,399,164	72.4
1939	6,025,494	28,728	113,571	5,940,651	90.8
1948	10,775,454	75,072	170,837	10,679,689	145.7
1949	9,966,542	70,309	146,026	9,890,825	132.6
1950	11,090,322	56,028	114,607	11,031,753	145.5
1952	10,911,981	58,035	176,640	10,793,376	137.5
1953	12,491,032	100,103	206,932	12,384,203	155.2
1954	12,326,700	55,016	275,839	12,105,877	149.1
1955	14,047,995	49,166	333,287	13,763,874	166.5
1956	14,380,760	35,349	348,144	14,067,965	167.4
1957	14,235,552	39,391	383,140	13,891,803	162.4
1958	14,240,800	39,267	361,994	13,919,073	160.2
1959	15,847,000	36,020	464,793	15,418,227	174.1

Source: U.S. Census Bureau.

U.S.A. PAPERBOARD PRODUCTION AND CAPACITY—1925-1959

(in short tons of 2,000 lbs.) By National Paperboard Assn.

Year	Capacity	Total Production	CONTAINERBOARD-DOMESTIC USE				BOXBOARD-DOMESTIC USE				All Other Paperboard
			Total	Liners	Corrugating Materials	Chip and Filler Boards	Total	Folding	Set-Up	Special Food Board	
1925	4,807,700	3,125,000	1,470,900	782,800	281,000	407,100	1,347,800	707,900	639,900	(a)	306,300
Avg '26-'29	5,471,875	3,754,650	1,781,750	960,800	353,600	467,350	1,467,100	848,900	618,200		505,800
1930	5,995,600	3,957,100	1,875,600	1,087,300	385,600	402,700	1,530,700	928,800	601,900		550,800
1931	5,943,800	3,804,000	1,815,000	1,071,900	383,800	359,300	1,475,600	921,000	554,600		513,400
1932	6,036,000	3,319,800	1,619,800	965,600	373,000	281,000	1,268,600	788,700	479,900		431,600
1933	6,252,100	3,938,800	1,978,900	1,214,500	459,800	304,600	1,446,900	895,300	551,600		513,000
1934	6,496,100	3,962,600	1,986,100	1,227,900	483,000	275,200	1,443,900	937,900	506,000		532,600
1935	6,798,500	4,555,000	2,309,000	1,440,800	587,200	281,000	1,578,200	1,047,100	531,100		667,800
1936	7,211,800	5,336,700	2,738,200	1,704,800	698,700	334,700	1,799,900	1,212,200	587,700		798,600
1937	7,309,900	5,555,500	2,880,500	1,800,000	737,500	343,000	1,807,800	1,237,800	570,000		867,200
1938	7,839,200	4,938,700	2,479,800	1,552,000	673,500	254,300	1,681,200	1,162,400	518,800		777,700
1939	7,834,100	5,953,900	3,000,300	1,877,900	837,900	284,500	1,970,700	1,385,000	585,700		982,900
Avg '30-'39	6,771,710	4,532,210	2,268,300	1,394,270	562,000	312,030	1,600,350	1,051,620	548,730		663,560
1940	8,007,700	6,326,100	3,147,600	1,965,900	903,400	278,300	2,026,300	1,413,100	613,200		1,152,200
1941	8,588,900	7,901,800	4,044,400	2,560,900	1,132,600	350,900	2,480,800	1,749,300	731,500		1,376,600
1942	8,528,200	7,163,700	3,607,300	2,272,200	932,100	403,000	2,381,400	1,440,500	615,900	325,000	1,175,000
1943	8,238,900	7,662,200	3,939,300	2,493,100	1,029,700	416,500	2,597,000	1,612,700	599,000	385,300	1,125,900
1944	8,561,200	7,961,900	4,123,100	2,598,200	1,089,900	435,000	2,590,300	1,660,700	543,100	386,500	1,248,500
1945	8,535,700	7,938,200	4,099,800	2,590,800	1,111,500	397,500	2,633,800	1,722,200	511,600	400,000	1,204,600
1946	8,846,300	8,492,400	4,313,700	2,721,800	1,263,100	328,800	3,028,700	2,109,000	474,100	445,600	1,150,000
1947	9,455,500	9,360,900	4,888,400	3,137,600	1,420,300	330,500	3,158,800	2,096,500	601,500	460,800	1,313,700
1948	10,092,800	9,588,200	4,960,300	3,251,600	1,387,300	321,400	3,149,300	2,066,400	639,500	443,400	1,478,600
1949	11,096,000	9,209,700	4,623,100	3,004,100	1,349,200	269,800	3,188,200	2,010,100	662,500	515,600	1,398,400
Avg '40-'49	8,995,120	8,160,510	4,174,700	2,659,620	1,161,910	353,170	2,723,460	1,788,050	599,190	420,275(b)	1,262,350
1950	11,861,200	11,149,500	5,692,600	3,709,000	1,670,000	313,600	2,792,900	2,358,100	729,800	705,000	1,664,000
1951	12,650,200	11,891,200	6,207,900	4,043,900	1,806,000	358,000	3,834,300	2,341,800	681,900	810,600	1,849,000
1952	12,999,400	11,049,500	5,637,600	3,682,800	1,625,800	329,000	3,656,500	2,186,400	635,300	834,800	1,755,400
1953	13,488,400	12,544,200	6,440,400	4,209,200	1,896,500	334,700	4,026,600	2,382,500	680,300	963,800	2,077,200
1954	13,961,400	12,286,000	6,234,200	4,105,700	1,876,700	251,800	4,010,000	2,396,900	611,000	1,002,100	2,041,800
Avg '50-'54	12,992,120	11,784,080	6,042,540	3,950,120	1,775,000	317,420	3,864,060	2,333,140	667,660	863,260	1,877,480
1955	14,628,900	14,043,700	7,244,200	4,789,600	2,165,400	289,200	4,407,400	2,625,900	636,700	1,144,800	2,392,100
1956	15,288,800	14,371,500	7,451,200	4,933,300	2,249,500	268,400	4,530,300	2,628,700	637,700	1,263,900	2,390,000
1957	15,765,400	14,188,900	7,340,300	4,872,700	2,215,700	251,900	4,529,600	2,707,000	568,800	1,253,800	2,319,000
1958	16,568,100	14,248,600	7,236,600	4,818,300	2,169,300	249,000	4,567,300	2,695,100	541,100	1,331,100	2,444,700
1959	17,358,700	15,970,000	8,219,400	5,487,000	2,474,600	257,800	4,921,900	2,683,500	586,700	1,451,700	2,828,700*

(a) Special Food Board Tonnage 1925 - 1941 included with Folding and All Other.
(b) Average based on 8 years.

* Containerboard Type 1,317,900
Boxboard Type 1,510,800

NORTH AMERICA

Canada

Conditions improve but competition in world markets is increasing, especially in newsprint

Population: 17,750,000. Per capita paper consumption: 280 lbs.
Paper mills: 95
Woodpulp (only) mills: 39
Other fiber pulp mills: 2

Production (short tons)	1958	1959
Paper and paperboard	8,081,293	8,584,470
Newsprint	6,195,553	6,394,172
Chemical woodpulp	4,606,661	4,995,375
Mechanical woodpulp	5,234,675	5,584,612
Woodpulp exports	2,213,701	2,460,133

Principal grades made: Newsprint, kraft and sulfite papers, book, fine, board.

By CHARLES L. SHAW
Canadian Editorial Director

There were several things for Canada's pulp and paper industry to be happy about in 1959, and good grounds for optimism concerning 1960. But there were also problems: some of them very tough indeed.

Markets for most of the industry's products continue buoyant, in pleasant contrast to conditions that prevailed not so many months ago. Production is at a high level, and many mills have been modernized, expanded or otherwise prepared to take advantage of increased sales. A majority of the companies report an improvement in earnings and net profits.

Those profits were never more necessary than they are today, with the industry's capital costs steadily climbing and the prospect of an increase in wages before the end of this year. Only an industry enjoying reasonable profits can expand.

But the industry could not afford to be jubilant. Conditions were better, but not spectacularly so. More than ever, there was reason for the people who manufacture and sell pulp and paper for Canadian companies to be conscious of competition in world markets. That brief but happy era when the Canadian industry could feel secure in the knowledge that it was producing a commodity that could not be produced as advantageously in many other countries has passed, perhaps never to return.

Canada Losing Newsprint Markets

Canada still tops the newsprint producing countries by a substantial margin, but its proportion of the world market has been reduced. While costs of production rise in Canada, some other countries have been invading markets that Canadians used to depend on. European pulp and paper products are underselling Canada surprisingly close to home territory, and rising newsprint production in the U.S. is cutting down Canada's share of the great American market.

Canada's newsprint sales to the U.S. continue to carry the handicap imposed by the Canadian dollar premium, although this has been sharply

PRINCIPAL STATISTICS OF CANADIAN PULP AND PAPER INDUSTRY

Year	Establishments	Capital	Employes	Salaries and Wages	Fuel and electricity purchased	Materials and supplies used	Gross Value of products
	No.	$	No.	$	$	$	$
1919	99	275,767,364	26,647	32,264,208	12,503,197	54,084,801	137,912,502
1925	114	460,397,772	28,031	38,560,905	17,506,735	76,514,990	193,092,937
1931	103	630,176,540	26,669	34,792,013	22,927,919	63,947,678	174,733,954
1937	98	570,352,287	33,205	48,757,795	29,121,065	91,121,629	226,244,711
1943	106	667,458,143	37,020	71,199,422	36,211,064	143,956,462	345,653,470
1949	123	1,100,000,000	52,050	157,703,868	41,370,633	272,681,606	836,148,393
1950	124	1,150,000,000	52,343	169,246,531	44,440,376	289,548,301	954,137,651
1951	126	1,200,000,000	57,291	213,169,906	75,625,718	421,280,139	1,237,897,470
1952	128	1,250,000,000	57,803	225,353,327	76,739,757	497,046,828	1,157,887,657
1953	127	1,300,000,000	58,194	235,741,660	80,379,515	499,350,994	1,179,934,934
1954	127	1,400,000,000	60,837	252,598,383	84,880,788	515,257,595	1,241,558,451
1955	128	1,550,000,000	62,500	262,598,000	91,040,773	546,079,000	1,326,938,138
1956	130	1,550,000,000	65,985	297,571,944	103,505,892	560,449,000	1,465,057,725
1957	132	1,600,000,000	65,940	307,627,849	108,636,965	617,175,797	1,411,934,462
1958	128	1,837,097,000*	64,084	307,415,615	105,796,875	597,804,877	1,406,522,541

*Estimated

CANADIAN PAPER PRODUCTION

	Newsprint		Total Paper	
	Tons	$ Value	Tons	$ Value
1917	689,847	38,868,084	853,689	58,750,341
1929	2,725,331	150,800,157	3,197,149	192,989,252
1932	1,919,205	85,539,852	2,299,767	114,115,570
1945	3,324,039	189,023,736	4,359,576	282,837,614
1948	4,640,336	402,099,178	6,063,646	582,346,000
1950	5,318,988	506,968,207	6,812,035	710,153,828
1952	5,687,051	600,515,000	7,201,800	838,105,108
1954	6,000,895	657,487,344	7,649,607	925,590,643
1956	6,445,110	735,644,099	8,466,785	1,070,355,000
1957	6,396,501	729,009,081	8,299,889	1,056,371,332
1958°	6,095,553	700,000,000	8,271,197	1,000,000,000
1959°°	6,394,172	735,000,000	8,584,470	1,103,250,000

°Estimates by PULP & PAPER; °°1959 estimates by Canadian Pulp & Paper Assn.
Source: Dominion Bureau of Statistics.

reduced in the last few months. The newly created trading blocs in Europe have injected another complication.

"We need a more vigorous and more flexible trading policy than we have at the moment both for the industry and Canada as a nation," declared Robert M. Fowler, president of the Canadian Pulp and Paper Association, recently. "We are far from clear as to where we are going and what we want."

Expansion at Slower Pace

In the face of these uncertainties, construction of new mills and large-scale expansion in other directions proceed at a relatively slow pace. Only on the Atlantic coast and in B.C. are new mills actually being built today.

The situation has put more and more emphasis on increased efficiency in the woods and the mills, more skillful and aggressive merchandising and salesmanship, more diversification and integration, more complete utilization of raw material and more encouragement to research.

The Canadian industry realizes that Sweden, for instance, is well ahead of Canada in total research expenditure, on a comparative basis, and a Canadian technical mission last summer learned that in Russia there will soon be 580 researchers on pulp and paper technology for each million tons of product, compared with only 62 per million tons in Canada. For a country such as Canada, so dependent on export trade (30% of gross national product compared with 6% in the U.S.), the expected emergence of Russia as a competitor in pulp-paper exports in a few years is a sobering threat, according to Mr. Fowler and other leaders.

EXPANSION REPRESENTING NEARLY $28,000,000 during the past three years is Great Lakes Paper Co's newsprint mill at Fort William, Ont. It is one of the four largest newspaper mills in the world. No. 4 paper machine, recently installed, 342 in. wide, has produced nearly 350 tons in 24 hours.

Canadian newsprint production last year was 5% higher than in 1958, but slightly below the 1956 peak. Of the industry's total paper production of more than 11,000,000 tons in 1959, about 1,900,000 tons consisted of paperboard and paper other than newsprint, including fine, book, writing, wrapping and building papers and board; but only about 10% of those products were exported, because of tariffs.

Total Canadian woodpulp production of over 10.6 million tons was fractionally higher in 1959 than the record established in 1956. About 77% of the total woodpulp output was used at home in the manufacture of newsprint, other papers and paperboard. Pulp exports, which accounted for 23% of the total production, were 11% higher than in the previous year.

CANADA: CAPACITY OF INDIVIDUAL NEWSPRINT MILLS FOR 1959

Abitibi Power & Paper Co. Ltd.		958,860
Beaupre, Que.	131,657	
Fort William, Ont	166,242	
Iroquois Falls, Ont.	276,246	
Pine Falls, Man.	147,702	
Port Arthur, Ont.	137,515	
Sault Ste. Marie, Ont.	99,498	
Anglo-Canadian, Pulp & Paper Mills Ltd.		277,497
Anglo-Newfoundland Development Co. Ltd.		241,896
Beaver Wood Fibre Co. Ltd.		35,226
Bowaters Corp. of North America Ltd. (Canadian)		468,789
B. Mersey Paper Co. Ltd., Liverpool, N. S.	145,848	
B. Nfld. P. & P. Mills Ltd., Corner Brook Nfld.	322,941	
Canadian International Paper Co.		938,124
Dalhousie, N.B.	281,808	
Gatineau, Que.	316,416	
Three Rivers, Que.	339,900	
Consolidated Paper Corp. Ltd.		857,475
Cap de la Madeleine, Que.	109,077	
Grand'Mere, Que.	161,298	
Port Alfred, Que.	246,891	
Shawinigan Falls, Que.	259,869	
Three Rivers, Que.	80,340	
Ocean Falls, B.C.	103,206	
Crown Zellerbach Canada Ltd.		265,289
Elk Falls, B.C.	162,083	
Donohue Brothers Ltd.		108,500
The E. B. Eddy Co.		54,760
Great Lakes Paper Co. Ltd.		359,676
Howard Smith Paper Mills Ltd.		137,252
Canada Paper Co., Windsor Mills, Que.	12,012	
Donnacona Paper Co. Ltd., Donnacona, Que.	125,240	
James Maclaren Co. Ltd.		126,072
MacMillan, Bloedel & Powell River Ltd.		731,196
Port Alberni, B.C.	213,850	
Powell River, B.C.	517,346	
Ontario Paper Co. Ltd.		389,031
Baie Comeau, Que.	177,984	
Thorold, Ont.	211,047	
Ontario-Minnesota Pulp & Paper Co. Ltd.		292,623
Fort Frances, Ont.	76,014	
Kenora, Ont.	216,609	
Price Brothers & Co. Ltd.		507,996
Kenogami, Que.	271,611	
Riverbend, Que.	236,385	
Richmond Pulp & Paper Co. of Canada Ltd.		117,236
St. Lawrence Corporation Ltd.		439,022
Dolbeau, Que.	136,269	
Red Rock, Ont.	62,351	
Three Rivers, Que.	240,402	
St. Raymond Paper Ltd.		27,501
Spruce Falls Power & Paper Co. Ltd.		277,173
TOTAL		7,611,194

EAST CANADA: Expands With New Mills, Speed-Ups

In Eastern Canada, apart from new mill construction as represented by Nova Scotia Pulp's $40,000,000 project on the Strait of Canso, now under way, most of the expansion has been in three main directions—machine speed-up, installation of high-yield sulfite facilities at newsprint operations, and diversification through acquisition of converting plants and similar factories.

In at least one instance, a Canadian company made plans to proceed with mill construction outside the national boundaries: Anglo-Canadian Pulp & Paper Mills is following Bowater's example in moving into the U.S.A. and is preparing to build a $60,000,000 pulp and newsprint mill near Texarkana, Texas. But this was the exception. Most of the companies decided that this was the time to get maximum use from established plant rather than build new mills.

One of the companies to install new capacity at existing mills was Abitibi Power & Paper Co., which is adding a fifth fine paper machine at Thorold, Ont. A new newsprint machine started production at the company's Fort William mill last year.

Abitibi was only one of several companies to turn to the high-yield sulfite process. Price Bros. & Co.'s installation at its Kenogami mill will be ready by mid-summer. Consolidated Paper Corp.'s Port Alfred mill started producing high-yield sulfite last fall, with every expectation of duplicating the results achieved at Belgo division when it moved into that field. Canadian International Paper Co. recently installed high-yield facilities on a fairly large scale at its Dalhousie mill, and on a smaller scale at Gatineau.

Irving Pulp & Paper Ltd. at Lancaster, N.B., is doubling consumption of pulpwood and fuel (to 1,000 cords of pulpwood and 50-60,000 gal. of oil a day) and installing machinery to bring production up to 250 tons of bleached kraft daily before the end of this year.

Thurso Pulp & Paper Co., Thurso, Que., is also expanding, and a $4,000,000 construction program is now in progress to increase capacity of high quality bleached hardwood and softwood pulp by more than 50%. This company is financed by the Singer Manufacturing Co. and Perkins-Goodwin Co., which owns a 30% interest.

Most of Fraser Companies' expansion this year is at its Madawaska, Me., mill, but it is installing a chlorine dioxide plant at Edmundston, N.B. for which the addition to the bleaching plant, in operation since 1958, was designed.

Swedish-U.S. Project

With the Nova Scotia Pulp Mill, Ltd., backed by Stora Kopparbergs of Sweden and Scott Paper Co. of U.S.A., nearing peak of construction, Canada's east coast is witnessing more activity in the pulp and paper field now than for many years.

And at Sheet Harbor, N.S., Halifax Power & Pulp Ltd., is putting in new drying equipment to expand export of baled groundwood.

One of the biggest expansion projects at an existing mill is Canadian International Paper Co.'s $10,000,000 job at LaTuque, Que., which will increase capacity of bleached kraft and laminating material by about 30,000 tons. On a somewhat smaller scale, Donohue Bros. at Clermont, Que., is modernizing and installing new equipment to add about 10,000 tons capacity.

C.I.P. Invests $70,000,000

Canadian International Paper Co., which reports a capital investment this year of some $70,000,000, acquired Hygrade Containers, Hendershot Paper Products and Continental Paper Products and expanded its Industrial Cellulose Research facilities. St. Lawrence Corp. acquired Hinde & Dauch Paper Co. of Canada and, with Canada Paper Co., is now manufacturing Clupak.

In the fine paper field, Howard Smith Paper Mills headed the expansion parade with its $16,000,000 development at Cornwall, Ont., where its new paper machine (40,000 tons a year) went into production in January.

Several companies have just completed major expansion and are concentrating on getting high returns from new equipment. Such a company is Great Lakes Paper Co., whose giant No. 4 machine (342 in. wide) was pushed to a new record of 357.7 tons of newsprint in one day last November.

Sunday Shutdown Disputed

One of the companies counting on machine speed-up to provide increased production is Anglo-Newfoundland Development Co. whose Grand Falls mill expects to get an increase of 60,000 tons a year by the end of 1962 as a result of installations now contemplated. The mill's present six-day capacity is now about 240,000 tons. Unlike conditions in British Columbia, eastern Canadian mills are compelled by law to shut down on Sundays and this is an issue of increasing interest because of the competitive situation and the high cost of new construction.

The KVP Co., which merged with Sutherland Paper Co. of Kalamazoo, Mich., at the beginning of the year, is installing a third paper machine in its Canadian Mill at Espanola, Ont., continuing a program of expansion which has been in evidence ever since the company took over this former Abitibi newsprint mill and converted it into an efficient bleached kraft producer. A chlorine dioxide bleach plant was completed last year.

INTERIOR CANADA: Soon Will Utilize Its Forests

—Edmonton, Alta.

Several years have elapsed since North Western Pulp & Power pioneered the field with the first Canadian pulp mill between the Rockies and Pine Point, Man.—the 430-ton bleached kraft operation at Hinton.

Every year or so, a new project is announced for Alberta, Saskatchewan or Manitoba, but invariably the problems of financing, access to markets or raw material supply have proved too formidable.

One of the more likely projects is now being pushed by various government agencies in Manitoba. Canadian and European capital is reported to be behind a proposed mill in the Thicket Portage area, about 400 miles north of Winnipeg. It would draw its energy from a 200-mile power line, costing about $10,000,000, from the Kelsey generating plant on the Nelson river, soon to be completed, or from some other power source in the region. Arthur D. Little, Inc. made a comprehensive survey in 1956.

Alberta Pulp Mills, Ltd., headed by J.A.R. Choate, of Red Deer, Alta., announced plans for a $50,000,000 kraft and boxboard mill near Rocky Mountain House, but while there have been negotiations with the Alberta government for pulpwood limits the deal has not yet been finalized.

For some time the Saskatchewan government has been endeavoring to induce capital to enter the pulp field in that province. A couple of years ago, Vancouver interests showed interest and a timber reserve was negoti-

MILL LOCATIONS

	Pulp Mills	*Pulp & Paper Mills*	*Paper Mills*	*Total*
Alberta	1	2	..	1
Newfoundland .	1	2	..	3
Nova Scotia ...	1	2	..	3
New Brunswick	4	3	..	7
Quebec	12	34	9	55
Ontario	6	20	15	41
Manitoba	..	3	..	3
British Columbia	7	7	..	14
Canada ...	32	73	24	137

Source: Dominion Bureau of Statistics.

ated, but when the market slumped the lease expired and no move was made to renew it.

The Saskatchewan government believes that mills may be built in the Hudson area and also adjacent to Prince Albert, but a survey found difficulty in encouraging a project in Saskatchewan because of transportation costs and the limited markets to be served. Even by 1975, the prediction is that the three prairie provinces will consume only about 125,000 tons of newsprint annually.

Prospects for a paper and board mill were discounted because 95% of these products manufactured in Canada are now from Quebec and British Columbia and their diversity would handicap establishment of a single mill.

WEST CANADA: New Pulp Mills Being Projected

Vancouver, B. C.

Reassured by improved markets and better earnings, the industry in British Columbia is again in the midst of a moderate expansion period, with mill construction and improvements now in progress representing an investment of more than $75,000,000.

Pulp and paper production in Canada's most westerly province last year was valued at $234,500,000, compared with $190,700,000 in 1958, and when it is recalled that ten years ago the figure was less than $80,000,000, the impressive performance of the industry can readily be appreciated.

Top of the list is Celgar's $50,000,000 bleached kraft mill and related operations at Castlegar in the Southeastern corner of the province, which will be turning out pulp at the rate of 500 tons a day early next spring. The mill has special significance because it will be the first pulp mill in British Columbia and west of the Canadian Rocky Mountains without tidewater location.

In dollars involved, second place in the current expansion programs for British Columbia goes to Rayonier Canada, Ltd., formerly Alaska Pine & Cellulose, which is converting its old Woodfibre dissolving pulp mill to a bleached kraft producer at a cost of about $15,000,000.

First Fine Paper Mill in West

Then comes the fine paper mill and flakeboard plant being built in the New Westminster area by MacMillan, Bloedel & Powell River Co. These two projects were initiated by Powell River Co. prior to the merger with MacMillan & Bloedel and both are now in production. Estimated cost was $8,000,000.

The fine paper mill, whose main piece of equipment is a Dominion Engineering machine, will have a capacity of about 14,000 tons a year. It will be the first fine paper mill in western Canada.

British Columbia Forest Products, Ltd., which recently completed its bleached kraft mill at Crofton, Vancouver Island, at a cost of $47,000,000, has announced plans for improving the mill at a cost of about $850,000.

Most Mills Are New

As a result of work carried out during the past few years, the entire industry in B. C. is now well conditioned for over-all improvement in the markets that is confidently expected.

Most of the mills are relatively new, some of the most important units having been completed within the past seven or eight years. Before World War II, for instance, the only major producers were at Powell River Ocean Falls, Port Alice and Woodfibre. Since then new mills, all of substantial size, have been built at Port Alberni, Duncan Bay (Elk Falls), Prince Rupert and Crofton, not to mention Sidney Roofing & Paper Co's fine new operation at Burnaby, representing the transfer of the company's plant formerly located at Victoria.

Within the past decade, big pulp and paper and integrated forest product communities have been created at Port Alberni, where MacMillan & Bloedel only recently completed an $83,000,000 expansion program, and at Duncan Bay, where Crown Zellerbach Canada has developed its newsprint-pulp-lumber complex represented by its Elk Falls division.

Merger Creates Huge Company

Of historic interest, the most notable event of the past year was the merger of the MacMillan and Bloedel interests with those of Powell River Co. to form one of the world's greatest forest products corporations. Apart from its pulp and paper production, MacMillan Bloedel & Powell River now stands second only to the giant Weyerhaeuser Co. in U. S. A. in lumber production in America.

Many factors led to the merger, probably the most pressing influence being the competition provided by the entry in Canada of big U.S. companies such as Crown Zellerbach, Rayonier, Celanese Corp. of America and Scott Paper Co.

The new company's mills have a capacity of 775,000 tons of newsprint annually, 252,000 tons of bleached kraft pulp, 83,000 tons of unbleached kraft pulp, 20,000 tons of unbleached sulfite pulp, 75,000 tons of kraft paper and board, 32,000,000 feet of ½ in. basis flakeboard, 12,000 tons of paper, in addition to large quantities of lumber, plywood, doors and shingles, converting plants, shipping and towboat facilities and a world-wide marketing organization.

New Pulp Mills

Recent developments indicate that at least two new major mills will be built in B. C. in the early future, depending on market trends. Among the most likely sites are the west coast of Vancouver Island, where Tahsis Co., a subsidiary of East Asiatic Co., has large timber holdings which are being developed with a view to eventually building a pulp mill somewhere in Vancouver Island's Gold River country; Prince George, center of a large and growing sawmill industry where it has been estimated that the wood residue from lumber activity would support at least one large pulp or paper mill, and the area north of Prince George where negotiations have been under way leading to establishment of one of the world's great water-power plants based on a Peace River dam. The Swedish financier, Axel Wenner-Gren, heads a group which may build several power plants and pulp mills.

Government Survey

The B. C. government recently issued a report of a survey indicating that Union Bay on the east coast of Vancouver Island, Kitimat on the northwest coast and Keremeos might also be prospective sites. Macmillan, Bloedel & Powell River has investigated Kitimat, where surplus power from the Aluminium Co. of Canada's operations might be available, and this is a possibility, although a rather remote one at present. The same company has been showing more interest in recent months in expansion southward into the U.S. It has control of the Brooks-Scanlon operation at Bend, Ore., and has plans for a pulp mill near there, and it has been studying proposals for a newsprint mill in Arizona in the U.S.

In its survey, the government through its Bureau of Economics and Statistics points out that British Columbia has an annual cut of approximately one billion cubic feet of timber. About 60% of this timber goes into lumber, 30% pulp and paper and 10% plywood. The optimum allowable cut (10 in. diameter and over) for the province is three times as high as the present cut. Of this additional two billion cubic feet, probably 60% would be utilized as pulpwood. This shift in proportion can be expected because of the nature of the timber and the trend of forest industry.

"In addition," the report continues,

MULTIMILLION DOLLAR INVESTMENT in pulp and paper at Port Alberni, on west coast of British Columbia. This is one of mills owned by merged MacMillan, Bloedel and Powell River Ltd. Bleached kraft pulp, newsprint and paperboard are made in these mills, one of the biggest establishments in the pulp and paper world to be located at one site.

FIRST PULP MILL IN REGION is Celgar's $50,000,000 bleached kraft project now being completed near Castlegar, B.C., on Columbia River. All other B.C. pulp and paper mills are located at tidewater. Left to right are: pulp warehouse, machine room, pulping group, administration offices, structure of recovery building, woodroom and construction bunkhouses.

"tremendous volumes of sawmill residues are available. The smaller sawmills in the interior still often waste 50% of their cut, which is usually burned because no market exists for waste products. As the total lumber production is close to 5,000,000,000 board feet yearly, B.C. could theoretically produce over a billion board feet (or the equivalent of pulp chips from sawmill waste which equal to more than 2,000,000 units one unit-200 cu. ft. gross cubic content).

"The trend towards production of pulp chips from waste in British Columbia has increased enormously during past years; 45% of all raw wood used in 1957 originated from pulp chips is approximately 1,000,000 units and obviously this could be substantially increased when required."

PULPWOOD IN CANADA: The Experts Disagree on Best Logging Methods

In the face of increasing low-cost competition from other countries, Canada is putting more and more emphasis on efficiency in the woods.

Considerable progress has been made during the past year in both Eastern and Western forests to expedite handling of pulpwood in greater bulk per unit, with a minimim of handling. It may not be practical to attempt anything like the degree of automation in the woods as in the mills, but whenever it is found expedient to perform with machines instead of manual power, that course is being followed. It is taking longer to jettison traditional methods in the East than in the West, where trees are bigger and heavier, but even in areas where a few years ago practices were being followed that seemed almost primitive, woods operations have assumed a "new look." The trend is towards more mechanization, flexibility and mobility for the simplest of reasons—it pays.

Pallets in Woods Double Output

Specially designed pallets are being used by some companies, notably Ontario Paper Co., to speed handling of the pulpwood harvest. In one season, the amount of pulpwood handled by this method almost doubled. The new technique permits better utilization of transportation equipment. In the past, trucks were idle while being loaded, whereas loaded pallets may be transferred quickly to the vehicle. At least one Canadian railroad has conducted trial shipments by pallet-equipped cars. The pallets are loaded in the bush and transferred by truck to the rail cars, eliminating several costly wood handlings. This practice has been followed in British Columbia, with larger loads, by a system of preloading of trucks, or loading one trailer with logs while another loaded trailer is being hauled by truck to dump or loading point.

Disagreement on Logging Methods

Members of a panel representing three of the major Eastern Canadian companies (CIP, Quebec North Shore and Kimberly-Clark) appearing before the annual meeting of the Woodlands Section, CPPA, were unable to agree on what should be the perfect logging system of the future. Some favored harvesting, branching and cutting of logs close to the stump to facilitate the handling operation. Others preferred whole-tree logging where trees are moved to a central landing to be branched and cut into lengths. The one point on which all three could agree was that increasingly large machines would be needed to handle increasingly large loads. Roughly, a similar trio of British Columbia experts would probably reach a similar conclusion, although it is now generally recognized that there is a limit to size of machine. Sheer size doesn't invariably lead to efficiency.

Chip Transportation in Pipes

In Eastern Canada, considerable interest is being aroused in experiments being carried out by the Pulp and Paper Institute of Canada in the field of transporting pulp chips by pipeline. Dr. Lincoln Thiesmeyer, president of the institute, has discussed this possibility for some time. Each year sees more progress made in this direction, even though the system has yet to be given commercial application.

Pilot plant trials involving the use of a 500 ft. pipeline to move a mixture of chips and water have been conducted, and indications are that the method will prove practical and economical. These trials are said to be far more rigorous than those that may be expected in industrial applications. Measurements of chip deterioration show that the only change appears to be a reduction in the size of the chips due to splitting along the grain.Other tests indicate that the pulp made from these smaller sized chips is as good as the normal commercial grade. It has also been determined that most of the chip splitting occurs in the pumping mechanism and that in many instances this could be overcome. If the pumps used are sufficiently powerful there is no danger of friction caused by plugging and large concentration of chips. Sharp bends have not proved troublesome, even with a half-wood, half-water mixture.

Calculations of the unit cost of chip pipeline transport have confirmed that it is competitive with alternative methods, including the river drive, if more than 350,000 cords

per year are to be moved. Weaving the pipeline into a system of branch lines to collect the wood from close to the stump is quite practical.

Portable Spar Trees

In British Columbia, probably the most interesting development in the woods has been the increasing use of portable spar trees. When the high-lead system became almost universal in the heavy stands of coast timber, the key unit in the operation was a tall, straight tree, not to mention the colorful high-rigger who prepared the tree for a complex of guy lines and cables later to be used in skidding the logs to its base, where the loading facilities were established. But preparation of these spar trees was a long and arduous task, and especially in recent years such trees were not always to be found in the logical location.

This situation has been met by the portable spar tree, usually a steel spar mounted on a sled or specially designed trailer that can be moved by tractor or truck from one location to another in a matter of a few hours, or even less.

Log transportation by truck is the accepted practice throughout Western Canada, although a quarter century ago railroad logging was standard procedure. Few companies use railroads for log hauling today except on main lines to the log dump on tidewater, but even then only rarely. As logging operations have gradually been extended to higher elevations the more maneuverable truck has become essential.

Steel Barges Supplement Rafts

More and more, the larger companies are turning to specially built steel log carriers in preference to the more familiar flat raft or Davis raft, the latter for long-distance open-water tows. The raft may never be entirely replaced, but there is much to be said for the steel carrier or barge most of them equipped with self-dumping devices and derricks for loading. These carriers, as large as many deepsea cargo ships, can be operated in any weather and season and loading and unloading can be accomplished in a fraction of the time taken to build rafts. And they require less manpower.

Chips Floated in Balls

Still in the experimental stage is a program to transport chips down the Fraser River in plastic or rubber balls—a method being pioneered by Crown Zellerbach Canada. It is one of several devices proposed for moving pulp chips from interior sawmills to coast pulp mills. One development has been the installation of mechanical chipping plants at several sawmills located hundreds of miles from the coast, but specially designed gondola cars on railroads will probably carry the bulk of this material—for the next few years anyway.

Forestry Progress

In the field of reforestation, two B.C. companies have embarked on a long-term project for the planting of exotic poplars in the Fraser Valley. While primarily for plywood processing, the residue will be converted into pulp by Westminster Paper Co.

One of the most spectacular innovations in tackling the forest fire problem is the utilization of a fleet of giant Mars transport planes equipped to pick up a load of 7,000 gal. of water and dump it on areas being attacked by fire. Such big loads have never been attempted before, and the experience of this fleet, to be operated this summer for the first time, will be watched with interest by the industry everywhere.

NEWSPRINT: Canada's Share of World Market Drops

Although some 30 countries are now producing newsprint in varying quantities, Canada has ranked as No. 1 in this category for many years. This year, with an estimated output of 6.4 million tons, Canada is a long way in front of the No. 2 producer, the U. S. A., with an estimated 2.1 million tons.

However, for the past 15 years Canada's share of total world newsprint production has tapered off. For instance, in 1945 Canadian newsprint mills accounted for 68% of the world market. Five years later the proportion was reduced to 54%, and in the 1959-60 period it is calculated at about 44%, which is approximately the pre-war position.

Canadian operations stand high among the world's great individual producers of newsprint. The world's largest newsprint manufacturer, Bowater Corp of Britain, has two mills in Canada. The second largest producer, International Paper Co., U.S.A., has three mills in Canada. Then follow three Canadian companies with 13 mills among them, all in Canada. These are Abitibi Power & Paper Co., Consolidated Paper Corp. and MacMillan, Bloedel & Powell River, in that order.

Ratings of Canadian Producers

There are 21 companies making newsprint in Canada, and the following list shows their 1960 capacity ratings as reported to Newsprint Association of Canada, in thousand tons (000 omitted):

	Rating	Mills	Machines
Albitibi Power & Paper	959	6	20
International Paper	938	3	16
Consolidated Paper	857	5	24
MacMillan-Bloedel Powell	731	2	11
Price Brothers	508	2	11
Bowater Corp.	469	2	8
St. Lawrence Corp.	439	3	9
Ontario Paper Co.	389	2	7
Great Lakes Paper	360	1	4
Ontario-Minnesota	293	2	5
Anglo-Canadian	277	1	4
Spruce Falls	277	1	4
Crown Zellerbach	265	2	4
Anglo-Newfoundland	242	1	7
Howard Smith Paper	137	2	4
James Maclaren Co.	126	1	2
Richmond Pulp & Paper	117	1	3
Donohue Brothers	109	1	3
E. B. Eddy Company	55	1	1
Beaver Wood Fibre	35	1	1
St. Raymond Paper	28	1	1
	7,611	41	149

The companies shown above in italics are wholly or partly owned by U. S. or British newspaper publishers and have a capacity of 1,185,000 tons, or 15% of the Canadian total. In all 42% of the Canadian total is owned in the U.S.A. or the United Kingdom.

80% of Newsprint for U.S.

Of Canada's newsprint output last year, Canadian consumers took 7%, U. S. A. 80% and the overseas market 13%. The U. S. A. bought 71% of its newsprint requirements from Canada.

The largest single newsprint mill in the world is MacMillan, Bloedel & Powell River's mill at Powell River, B.C. Next are two of the Bowater mills, one in England and one in Tennessee, U.S.A. Another Canadian mill, Great Lakes Paper Co's operation at Fort William, Ont., ranks fourth.

CANADIAN STATISTICS

CANADA'S PULP EXPORTS

	Tons	Value
1921	527,222	$33,133,675
1926	1,003,081	52,077,122
1932	452,292	18,930,065
1937	870,711	41,815,731
1942	1,510,727	95,266,873
1947	1,698,712	177,802,612
1951	2,260,834	365,132,884
1953	1,950,152	248,674,880
1955	2,366,133	297,304,069
1956	2,374,013	304,526,497
1957	2,232,185	292,406,102
1958	2,213,701	285,203,526
1959	2,450,027	311,252,798

Source: Canadian Dominion Bureau of Statistics and Canadian Pulp and Paper Association.

CANADIAN NEWSPRINT CAPACITY

(In thousands of short tons)

	Rated Capacity	Idle Capacity	Operating %
1925	1,715	193	88.8
1930	3,600	1,096	69.6
1935	3,914	1,163	70.3
1940	4,368	949	78.3
1945	4,301	1,042	75.8
1949	5,113	nil	101.2
1951	5,360	nil	100.7
1953	5,723	nil	100.
1955	6,190	nil	—
1956	6,242	nil	103.6
1957	6,756	nil	94.7
1958	7,239	nil	82.9
1959	7,521	nil	85.0

Source: Newsprint Association of Canada.

PULPWOOD PRODUCTION FOR CANADA BY PROVINCES

	1957	1958
Quebec		
Cords	6,637,000	5,983,079
Value	$186,339,542	$165,281,822
Ontario		
Cords	3,818,598	3,623,635
Value	$108,438,295	$106,041,093
British Columbia		
Cords	1,453,354	1,398,168
Value	$28,564,785	$24,735,463
Other Provinces		
Cords	3,078,954	2,758,762
Value	$77,282,130	$69,395,843
All Canada		
Cords	14,987,885	13,763,644
Value	$400,624,754	$365,454,221

ROUNDUP OF CANADIAN STATISTICS—1958-1959

	Production		Exports	
	1959	1958	1959	1958
Gross value of output	$1.5 billion	$1.4 billion	$1.1 billion	$1 billion
	Short tons	Short tons	Short tons	Short tons
Total woodpulp	10,639,529	9,995,983	2,460,133	2,213,692
Dissolving & spec. chemical	363,569	306,551	308,785	248,789
Bleached sulfite	539,651	553,775	333,061	349,191
Unbleached sulfite	1,574,404	1,558,383	185,032	209,424
Bleached sulfate	1,308,839	1,118,627	1,036,061	880,669
Unbleached sulfate	955,127	833,862	313,335	259,353
Other chemical	250,033	235,463	39,292	32,343
Groundwood	5,584,612	5,323,946	238,105	226,498
Newsprint	6,394,172	6,095,553	5,952,704	5,609,024
Containerboard	520,045	486,513	59,885	50,531
Boxboard	433,335	420,258	16,674	26,497
Total paperboard	953,380	906,771	76,559	77,028
Fine paper	277,734	254,068	17,834	15,873
Coated paper	33,467	30,960	1,191	1,227
Other printing paper	103,521	91,636	71,609	63,820
Special papers	132,304	128,357	3,919	3,785
Wrapping papers	318,852	287,927	40,907	28,720

These figures cover only those reported to the Canadian Pulp & Paper Assn. They account for more than 98 per cent of the industry's output. They do not include defibrated and exploded pulps and a small tonnage of some papers and boards. There are also some slight duplications in figures. Some paperboard and wrapping paper is used by the mills for packaging. Coated paper mostly covers tonnage that undergoes further processing after it leaves the paper machine and thus is also included under other grades. Total woodpulp production includes screenings. In addition to woodpulp, the industry uses annually in manufacture of paper some 470,000 tons of waste paper, straw, rags, and other fibers.

NEWSPRINT EXPORTS FROM CANADA

(Short Tons)

	U.S.A.	Overseas	Total
1935	2,052,000	523,000	2,575,000
1940	2,586,000	657,000	3,243,000
1945	2,534,000	525,000	3,059,000
1950	4,724,000	214,000	4,938,000
1953	4,885,000	455,000	5,720,000
1955	5,070,211	734,902	5,805,113
1957	5,054,729	852,664	5,907,393
1958	4,826,696	1,217,620	6,043,316
1959	5,117,766	834,938	5,952,704

Source: Newsprint Association of Canada.

CANADA—PULP PRODUCTION

(Tons of 2,000 lbs.)

	Mechanical Tons	Sulfite Tons	Alkaline Tons	Total Tons
1920	1,090,114	654,273	188,487	1,922,774
1925	1,621,917	842,785	242,207	2,706,909
1930	2,283,130	1,076,804	188,253	3,548,187
1935	2,458,000	1,025,000	206,000	3,689,000
1940	3,305,484	1,480,545	399,267	5,290,762
1945	3,341,920	1,639,684	478,740	5,460,344
1950	4,910,803	2,110,773	1,053,588	8,075,164
1953	5,122,537	2,398,543	1,440,517	8,961,597
1955	5,429,162	2,795,720	1,642,356	9,867,238
1957	5,516,713	2,237,462	2,421,532	10,176,707
1958	5,323,946	2,418,709	2,253,328	9,995,983
1959	5,584,612	2,114,055	2,267,718	10,639,529

Source: *Canadian Pulp and Paper Association*
*Preliminary

CANADIAN WOODPULP STATISTICS—1959

(in short tons)

	Production	Imports	Exports	Consumption	Apparent Supply
Groundwood	5,584,612	—	232,782	5,584,612	5,584,612
Sulfite, paper grades	2,114,055	28,328	512,724	1,608,001	1,631,596
Sulfate, paper grades	2,267,718	3,018	1,353,245	907,430	917,491
Dissolving and Special alpha	363,569	14,641	295,618	56,849	82,592
Total	10,639,529	45,987	2,460,133	8,182,051	8,225,383

Source: Dominion Bureau of Statistics

CANADA'S FOREST RESOURCES—Merchantable and Accessible

Saw Timber (10" D.B.H. and Up)—in Millions of Feet Board Measure

	Newfdland	Prince Edward Island	Nova Scotia	New Brunsw'ck	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Coast	Columbia Interior	All Canada
Softwood	3,127	65	4,849	5,000	38,181	42,775	815	580	7,000	76,108	33,630	212,130
Hardwood	—	40	1,261	1,500	14,019	11,529	1,630	1,010	2,080	*	*	33,069
Total All Species	3,127	105	6,110	6,500	52,200	54,304	2,445	1,590	9,080	76,108	33,630	245,199
Smaller Material (4" D.B.H.) in Thousands of Cords												
Softwood	31,902	560	23,167	60,000	450,495	261,515	9,900	3,200	74,400	13,922	172,364	1,101,425
Hardwood	—	240	5,363	30,000	176,108	300,380	19,090	50,130	36,000	*	*	617,311
Total All Species	31,902	800	28,530	90,000	626,503	561,895	28,990	53,330	110,400	13,922	172,364	1,718,736

* British Columbia forests contain considerable quantities of hardwood, but no complete inventory has yet been made.
Source: Dominion Forest Service.

CANADIAN WOODPULP PRODUCTION BY PROVINCES

(Quantity in Tons—Value in Dollars)

		Quebec	*Ontario*	*British Columbia*	*Other Provinces*	*Total*
1945	Tons	2,887,176	1,468,682	520,571	724,385	5,600,841
1945	Value	$114,197,036	$62,596,260	$21,998,381	$33,081,445	$231,873,122
1950	Tons	3,922,543	2,297,518	776,896	1,476,067	8,147,014
1950	Value	$216,299,900	$156,390,753	$49,381,923	$80,511,349	$502,583,925
1952	Tons	4,192,047	2,308,722	915,634	1,552,606	8,968,009
1952	Value	$280,314,341	$182,773,000	$82,551,730	$104,382,109	$650,021,180
1955	Tons	4,491,139	2,602,298	1,363,761	1,693,340	10,150,547
1955	Value	$280,171,743	$196,235,632	$107,637,777	$109,357,679	$693,402,831
1956	Tons	4,809,011	2,735,241	1,423,943	1,765,579	10,733,744
1956	Value	$296,884,619	$178,012,929	$120,495,242	$110,839,744	$706,232,524
1957	Tons	4,605,850	2,746,177	1,375,848	1,697,417	10,425,295
1957	Value	$287,727,250	$207,305,585	$97,155,404	$115,006,410	$706,194,649
1958	Tons	4,223,227	2,736,456	1,453,854	1,723,917	10,137,454
1958	Value	$256,238,044	$217,476,915	$103,849,925	$125,800,710	$703,365,594

Source: *Dominion Bureau of Statistics*

CANADIAN PAPER PRODUCTION BY PROVINCES

(Quantity in Tons—Value in Dollars)

		Quebec	*Ontario*	*British Columbia*	*Other Provinces*	*Total*
1945	Tons	2,292,442	1,267,796	334,502	464,836	4,359,576
1945	Value	$148,180,691	$86,395,223	$20,353,984	$27,907,716	$282,837,614
1951	Tons	3,511,669	2,019,235	513,165	1,181,202	7,225,271
1951	Value	$389,554,493	$251,918,611	$59,763,061	$122,793,484	$824,029,649
1953	Tons	3,542,987	2,018,843	632,556	1,182,140	7,376,526
1953	Value	$416,505,144	$263,409,878	$74,131,677	$133,811,774	$887,858,473
1955	Tons	3,789,087	2,225,109	725,096	1,260,921	8,001,213
1955	Value	$453,543,730	$298,099,787	$86,193,930	$143,601,800	$981,439,247
1957	Tons	4,100,000	2,275,000	740,000	1,184,889	8,299,889
1957	Value	$500,000,000	$320,000,000	$88,000,000	$148,371,322	$1,056,371,322
1958	Tons	3,688,185	2,355,221	828,864	1,209,023	8,081,293
1958	Value	$467,118,921	$329,282,955	$100,724,925	$147,513,399	$1,044,640,200

° Estimated

CANADIAN PULP AND PAPER PAYROLL DATA

	Total Employes	*Employes On Salary*	*Average Salary*	*Employes On Wages*	*Average °Wage*	*Total Salaries-Wages*
1920	31,298	2,669	$2,449	28,629	$1,352	$ 45,253,893
1939	31,016	4,382	$2,482	26,634	$1,271	$ 44,737,739
1947	49,946	7,706	$3,411	42,240	$2,443	$129,477,995
1950	52,343	8,578	$4,163	43,765	$3,051	$169,246,531
1953	58,194	9,394	$5,315	48,800	$3,808	$235,741,660
1954	60,837	9,689	$5,500	50,309	$4,000	$252,598,383
1955	62,205	9,933	$5,636	52,272	$4,004	$262,600,000
1956	65,985	10,867	$5,896	55,118	$4,264	$300,000,000
1957	65,940	11,495	$6,121	55,445	$4,356	$307,627,849
1958	64,084	11,594	$6,404	52,490	$4,442	$307,415,615

° Woods labor not included.
Source: Dominion Bureau of Statistics.

CANADIAN PULPWOOD (in cords)

(All quantities are given in terms of rough or unpeeled wood)

	Production	*Consumption*	*Exports*	*Imports*
1925	5,092,461	3,668,959	1,423,502	
1930	5,977,183	4,741,349	1,330,466	94,632
1935	6,095,016	5,005,083	1,109,873	19,940
1940	8,716,541	7,110,754	1,551,600	47,626
1945	10,973,094	7,659,899	1,684,421	4,133
1949	10,308,776	10,470,481	1,644,253	5,491
1950	13,424,353	11,434,908	1,782,134	28,220
1951	18,156,282	12,634,426	2,893,615	46,634
1952	14,755,082	11,991,074	2,529,353	31,060
1953	13,545,176	12,109,658	1,783,657	48,805
1954	14,739,565	12,981,000	1,826,193	105,030
1955	16,087,953	13,629,413	1,882,784	134,917
1956	17,556,265	14,031,855	1,953,470	188,144
1957	14,967,600	13,187,474	1,800,411	179,614
1958	12,732,364	12,477,330	1,286,214	146,835

Source: Dominion Bureau of Statistics.

CANADIAN FORESTS—1958

	Sq. Miles
Forested areas (All except 275,800 sq. mi. lies within the ten provinces)	1,612,592
Forested areas classed as unproductive (small trees in adverse locations not expected to reach merchantable size)	652,308
Productive forest areas	960,284
Potentially accessible productive forests	239,864
Accessible production forests (about half bears trees classified as merchantable—4 in. dbh and over; remainder is young growth)	720,420

Source: Federal Forestry Branch

FOREST HOLDINGS—1958

(net area, excluding rivers and lakes)

	Sq. Miles	*Percent*
Occupied forest lands:		
Provincial Crown:		
Leases and licenses	186,039	19.4
Permits and sales	5,727	0.6
	191,766	20.0
Federal Crown:		
Leases and licenses	298	.0
Other lands	6,927	0.7
	7,225	0.7
Privately-owned:		
Farm woodlots	35,401	3.7
Other	56,722	5.9
	92,123	9.6
Total occupied forest lands:	291,114	30.3
Unoccupied forest lands:		
Provincial Crown	586,534	61.1
Federal Crown	82,636	8.6
Total unoccupied forest lands:	669,170	69.7

Source: Federal Forestry Branch

FOREST CONSUMPTION

Average Annual Depletion 1947-1956

Products Utilized	*Thousands of cu. ft.*	*% Utilized*	*% Depleted*
Logs and bolts for domestic use	1,442,333	45.8	42.4
Logs and bolts for export	10,208	0.3	0.3
Pulpwood for domestic use	1,063,090	33.8	31.3
Pulpwood for export	175,521	5.6	5.2
Fuelwood	376,206	12.0	11.1
Ties, poles, pitprops, rails	58,905	1.9	1.7
Miscellaneous	18,583	0.6	0.5
	3,146,846	100.0	92.5
Loss by fire°	254,724		7.5
	3,401,570		100.0

(Figure for depletion does not include agencies other than fire)

°Excludes Newfoundland.

Source: Federal Forestry Branch

CONIFEROUS STANDS

Estimated Stands of Accessible Conifers by Provinces

	Millions of cu. ft.	*Pulpwood Production Cords—1957*
Newfoundland	13,245	793,387
Prince Edward Island	100	22,004
Nova Scotia	4,832	384,486
New Brunswick	11,947	1,416,581
Quebec	44,239	6,378,666
Ontario	53,436	3,980,101
Manitoba	5,707	303,359
Saskatchewan	5,590	57,763
Alberta	29,844	323,804
British Columbia	301,874	1,432,662
Yukon Territory	2,568	—
Northwest Territories	3,460	—
	476,842	15,092,813

Source: Federal Forestry Branch and Dominion Bureau of Statistics

Noteworthy

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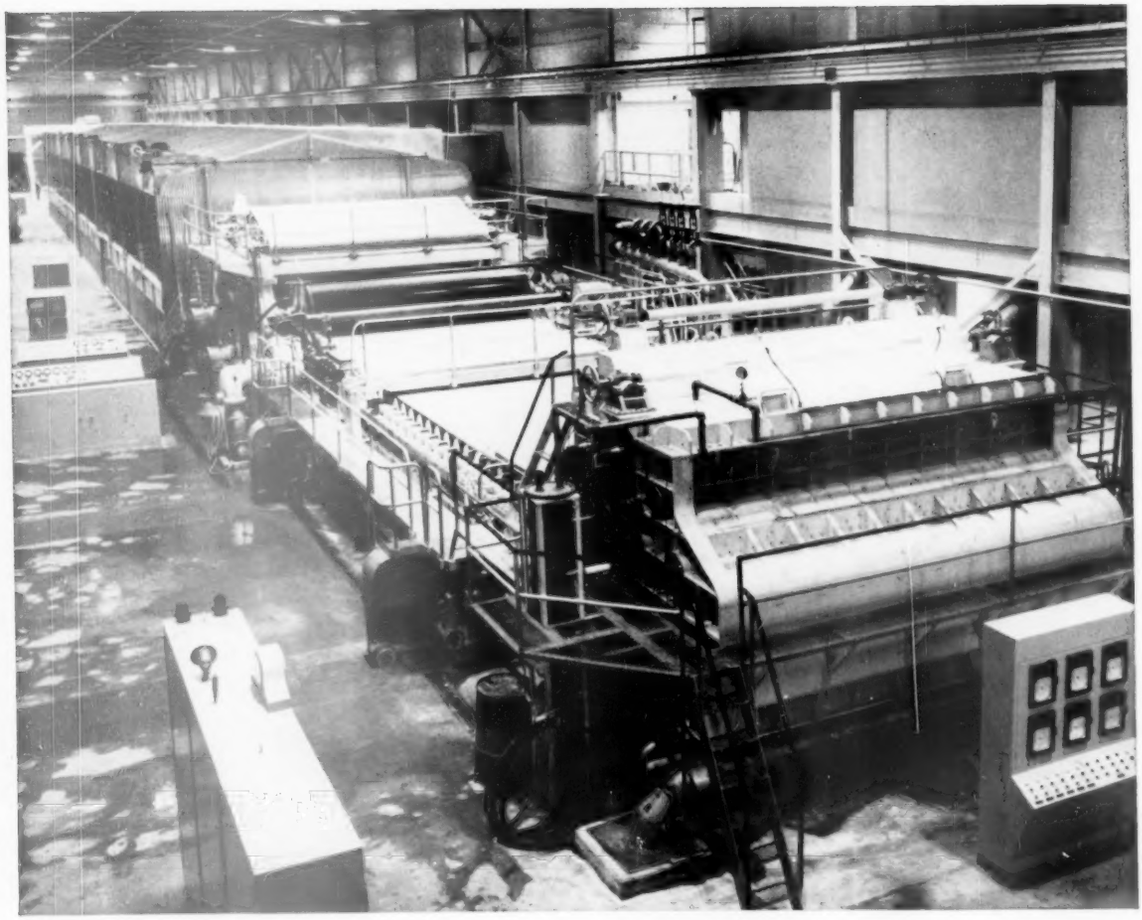

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built by Dominion Engineering and
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It incorporates many
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Leadership...by design
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JULY, 1960 | *Published for the information of paper and board mills* | VOL. 2, NO. 5

WINDER VITAL FOR BUILDINGBOARD PAPERS

Beaver Wood Fibre Company Uses 2 New Langston Units To Make High Quality Rolls

In the manufacture of paper for plasterboard and wallboard, the slitter and winder can make a valuable contribution to insuring customer satisfaction with the finished product.

On it depend tightness of the roll, its freedom from dust, accuracy of the slit edge and whether the roll presents to the customer an attractive appearance or not.

As one veteran paper maker put it: "It's no use making good paper or board if it isn't wound as a good package. The winder will make the difference in packaging the product."

• • •

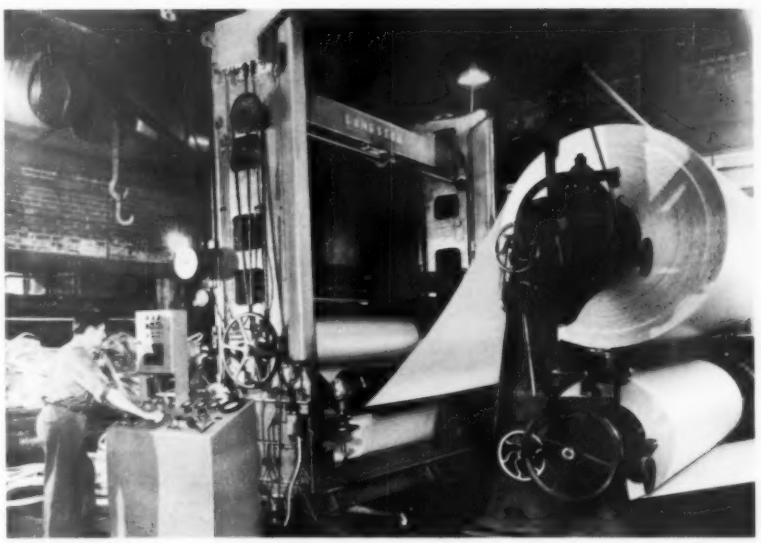
With this, plant superintendent F. Harold Cowan of Beaver Wood Fibre Company, Ltd., of Thorold, Canada, is in agreement. And the winder that's making the difference at this mill is a Langston DA type—two new ones in fact, one behind each of the mill's 112-inch cylinder machines.

COMPANY'S NAME FOR PRODUCT MAKES WEBSTER'S DICTIONARY

It's not often that a company's product finds its way into the Webster dictionary as beaverboard has for Beaver Wood Fibre Company, Ltd., of Thorold, Canada.

Here the famed buildingboard for walls and partitions first was made in 1913, then of virgin ground wood and now mainly of waste paper.

Another first for the company: in 1936, its paper machine made newsprint of southern pine.



LANGSTON WINDER behind cylinder machine at Beaver Wood Fibre Company, Ltd., Thorold, Canada, is fed from two-roll reel spool.

Harold Cowan will tell you that more than appearance, though, is imparted to the rolls produced on the Langston winders. The dust free, shear cut slitters, for example, provide an important attribute.

In making plasterboard, the sheet must be dust free for a vital reason. The bottom sheet is covered with slurry, except the margin which is to be folded up over the top sheet. A stream of glue is sprayed on the edge and the fold must stick. Dust on the sheet hampers this adhesion and can result in faulty plasterboard.

• • •

On the other hand, in wallboard production, tightness of the roll is vital. A tightly wound roll can make a world of difference to the product that will come off the laminator or paster. Exact trim also is an increasingly important requirement as the speed of converting equipment becomes higher. The slit of the sheet edge must be highly accurate. Runout can act like a snag.

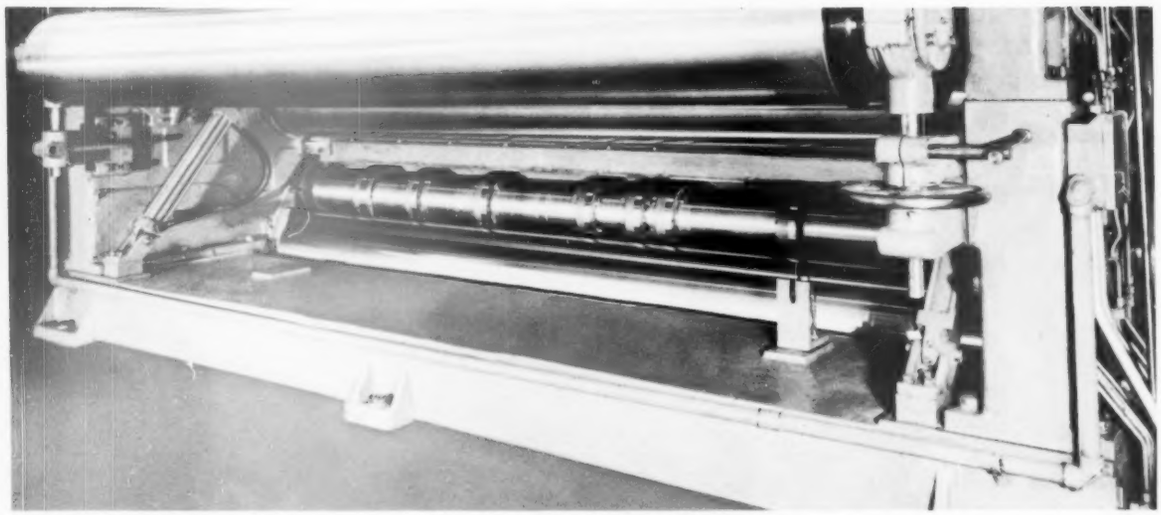
Says Cowan:

"The Langston winders are producing excellent quality rolls. The paper ranges in weight from 54 lbs. to 200 lbs., and the caliper from 55 point to 15 point. They're rewinding about 100 tons a day from each machine.

"Since the units started up in the last week of October last year, we've never lost a roll on the Langston winders. They've all been good tight rolls, free of dust. We've had no problem of offsets or annular rings. Credit

(Continued on Page 2)

ROLL QUALITY is examined by Beaver Wood Fibre's plant superintendent F. Harold Cowan, right, and board mill superintendent C. O. Simpson. Company reports rolls from two new Langston Winders are tightly wound, dust free and of highly accurate edge cut.



SLITTER ASSEMBLIES on power driven shaft are a Langston patented type, guaranteed against any runout exceeding .001". Note hydraulic cylinder at far side of machine for automatic roll ejection, and heavy construction of bedplate.

Winder Vital

(Continued from preceding page)

for the latter belongs to Langston's new shear cut, slitter-head assembly."

• • •

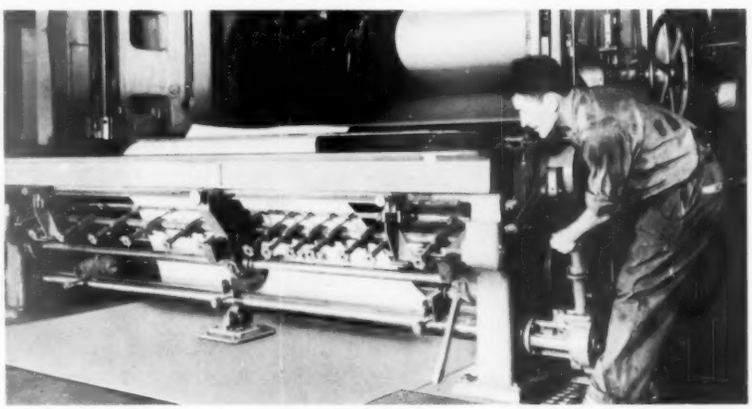
The winders are built to take rolls with diameters up to 78 inches, drawing directly from Beaver Wood Fibre's two-roll reel spools and utilizing the latter's manual constant tension control. Features of the winder include hydraulic roll ejection, and rider roll control for tighter roll starts and uniform density throughout the roll.

Beaver Wood Fibre produces annually about 52,000 tons of paperboard, 85 percent of which goes into boards for the building trades, the greater part into plasterboard and a lesser into wallboard. Boxboards of all grades comprise the remaining 15 percent of output.

• • •

A division of Bestwall Gypsum Company, Ardmore, Pa., Beaver Wood Fibre is part of an integrated operation from forest to finished material.

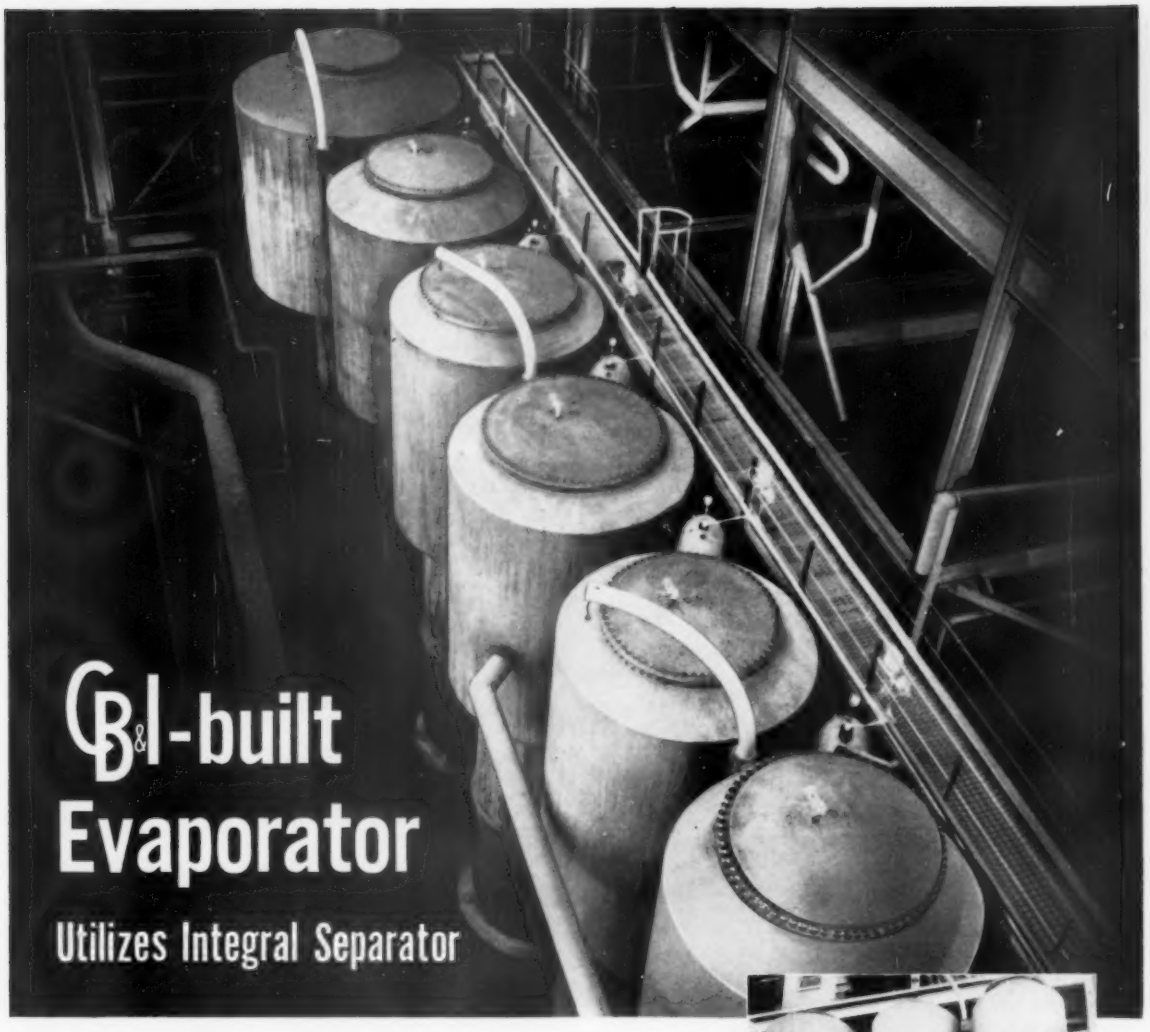
Its paper for plasterboard is partly consigned to other Bestwall mills, partly for sale on the open market. Wallboard is made at the Thorold mill, at a monthly rate of between three and four million square feet, for customers principally in Canada and Newfoundland and in the United States Midwest. Its boxboards go into such well known products as Kellogg's Corn Flakes, for example.



FRONT SLITTER is engaged by operator prior to starting up next rewind. Fixed angle of slitters eliminates blade chipping and wear due to improper setup. Langston shear cut slitter arrangement has proven best method yet devised to get clean cut, dust free rolls.

ALL CONTROLS are incorporated at single station console to make the work of the operator easier and more accurate.

Printed in U.S.A.



CB&I-built Evaporator

Utilizes Integral Separator

This six-body sextuple effect evaporator was built by CB&I for Container Corporation of America at Brewton, Alabama. It utilizes CB&I's patented integral separator, eliminating all external piping and valves . . . minimizes pressure drop and temperature loss across the system.

Tube sheets in all vessels and lower vapor body sections of No. 1 and 2 effects are fabricated of corrosion-resistant stainless steel Hortonclad®, assuring longer performance life.

A bulletin describing CB&I's *coordinated* services and equipment for the pulp and paper industry is available. Write for it today.

Top view: CB&I-built evaporator at Container Corporation of America plant, Brewton, Alabama. Easy accessibility for maintenance keynotes entire installation.

Directly above: CB&I patented integral separator eliminates external piping and valves . . . minimizes pressure drop and temperature loss.

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Strong on corrosion resistance

21-ton Nickel stainless steel roll stays smooth, provides improved suction

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- **Long wearing qualities**

That's why cast stainless steel suction rolls are fast becoming favorites with operators of high speed paper machines...

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Have you a problem that a stainless steel casting might solve? Easiest way to find out is to write for our valuable booklet, *Heat Resistant Castings, Corrosion Resistant Castings, Their Engineering Properties and Applications.* It's free on request. Just ask for "Booklet A-266."

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*SCRIPTITE: Reg. U. S. Pat. Off.

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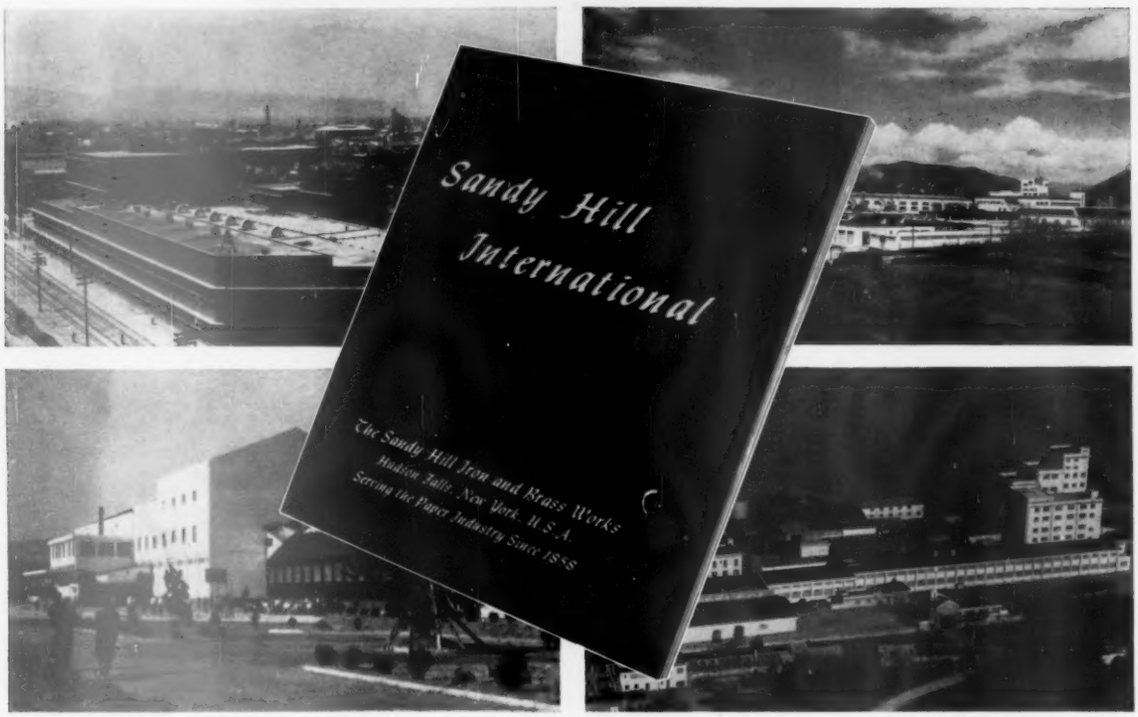
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EUROPE IS A BIG CUSTOMER for growing $3 billion global pulp and paper trade

EUROPE

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EUROPE

W. Germany

Increased production to combat rising imports

Population: 54,016,000. Per capita paper consumption: 156 lbs.
Paper and paperboard mills: 371 (including woodpulp mills and straw or vegetable fiber mills)

Production	1958	1959
	(short tons)	
Paper and paperboard	3,218,695	3,430,551
Chemical woodpulp	818,062	866,304
Mechanical or groundwood pulp	714,959	722,254
Straw or other vegetable fiber pulp	54,183	58,979
Paper and board imports	728,309	893,225
Paper and board exports	77,276	86,466
Woodpulp imports	520,527	625,648
Woodpulp exports	75,453	103,646

Principal paper grades made: Newsprint: 268,052; kraft papers: 197,429; sulfite papers: 872,295; book & writing papers: 770,235; paperboard: 877,892; special papers: 444,648.
Principal paper imports from: Finland, Sweden, Austria
Principal paper exports to: Netherlands, Sweden, Great Britain
Principal pulp imports from: Sweden, Finland, Austria
Principal pulp exports to: Italy, Netherlands, France

By DR. EMIL FISCHER
Economics Editor for Germany
PULP & PAPER INTERNATIONAL

—Bonn

Following the recession of 1958, there was recovery in the spring of 1959 that extended almost without interruption throughout the year. Thus, the 1958 record in West German pulp and paper mills was not only reached, but exceeded in almost all grades.

According to the index of industrial production (1950 = 100; 1959 monthly average = 185; 1958 = 174), total production increased by 6.3%. Sales, however, went up only 4.5% from 2.9 billion to 3.1 billion DM (1 Deutsche mark = $0.239), so that profits did not correspond with the increased output.

In comparison, production of the paper converting industry improved quantitatively by 9%, value-wise by only 6.7%.

Production Scores Gain

In 1959 total production of paper and paperboard reached 3,100,000 metric tons, an increase of 6.6%. The growth rate of paper pulp—with 519,000 metric tons and a 4.2% increase—remained below synthetic fiber and refined pulp output, which—after overcoming a wordwide crisis in the synthetic fiber field—recovered rapidly in 1959 to 189,000 metric tons, up 10.8%.

Within the OEEC nations (excluding Finland) the Federal Republic of Germany's share in paper and paperboard production for the first six months of last year was down to 18.8% as compared to the 19.7% in the first half of 1958.

However, at 25.7%, West Germany accounted for a rising share of paper and paperboard imports of OEEC countries, while exports at 1.9% remained unchanged. Consumption was 22.5% of the OEEC total, down slightly from the 22.8% of a year earlier.

And during the first half of 1959 West German paper and paperboard production within the European Economic Community amounted to about 38%, imports to 52%, exports to 11% and consumption to 42%.

Raw Material Consumption

During the past fiscal year the paper industry in West Germany consumed some 6,400,000 rm barked pulpwood; 234,000 metric tons straw; 1,158,000 tons wastepaper; 84,000 tons rags and linters; 634,000 tons sulfite pulp; 327,000 tons sulfate pulp, and 612,000 tons groundwood pulp. In all categories but one (rags and linters) consumption figures showed considerable gains.

The 1,000-ton decrease in consumption of rags and linters was more than balanced by a 63,000-ton gain in wastepaper, 29,000 tons in sulfite pulp, 42,000 tons in sulfate pulp and 11,000 tons in groundwood.

DR. EMIL FISCHER is the economic editor for Germany. He has been the chief economist of the Management Association of the German Pulp and Paper Industry for many years, formerly in Berlin, now in Bonn.

Consumption of coal and fuel oil was up some 7%, that of electricity about 6%. Fuel oil alone scored a 54% increase.

Prices Steady to Lower

Despite the upswing following the first quarter, the price trend remained weak until the end of the fiscal year. According to the official producer price index for the entire pulp and paper industry (1950 = 100), the price level was lowered by nearly 3% after the first of the year. Pulp prices were reduced almost 4%, paper and paperboard prices 2.3%. On an annual average, overall price level in pulp and paper declined 4.5% from 1958 to 1959. The price trend in converting showed a similar tendency (January = 127, December = 123), while that of the printing trade rose slightly from 130 in January to 132 in December.

On an average, 76,700 persons were employed by the industry, practically unchanged from the 76,800 of 1958. In paper converting the number employed rose by 1,400 to 99,200, in the

COMMON MARKET'S GIANT PAPERBOARD MACHINE is this 153-in. (3.90 m) wide Dorries combination cylinder-Fourdrinier with on-machine coater at Feldmühle's Arnsberg mill in West Germany.

graphic arts by 4,500 to 174,200. At 157,300,000 man-hours the pulp and paper industry nearly equalled the preceding year (157,900,000). Wages amounted to some 391.1 million, up 7% from the year before.

Imports, Exports Up

Foreign trade in pulp, groundwood, paper and paperboard was greater than in 1958 both in regard to imports and exports. Imports increased by 15.9% from 808.9 million to 937.6 million DM. Imports of paper and paperboard, with a turnover of 560 million DM, rose by 18.9% (in quantity by 22.7%). Exports of pulp, groundwood, paper and paperboard increased in value by 15% to 202.2 million DM.

Import of pulp rose by 77,300 metric tons to some 576,000. Groundwood was up 7,300 to 28,700 tons. Also, supplies of paper and paperboard increased from 660,500 to 810,100 metric tons. Some 482,000 metric tons of paper pulp were imported and 94,100 tons of synthetic fiber pulp.

Of the paper pulp imported, 329,000 metric tons were sulfate (up 23%), 114,600 tons bleached (up 22%), 58,400 tons semi-bleached (up 38%) and 156,000 unbleached (up 18%).

While supplies of bleached and semi-bleached sulfate pulp increased by 27.2%, imports of unbleached sulfate rose by 18.3%. Some 153,000 metric tons of sulfite pulp, straw and esparto pulp were imported, 12.8% more than in the previous year; of this, 90,300 tons were bleached, 55,900 unbleached.

48% Newsprint Imported

Import share in the consumption (production + import − export) of paper and paperboard increased during the fiscal year to 21.1% from the 1958 figure of 18.8%. Compared to production, imports amounted to 26% (up from the 22.6% of 1958). In 1959 some 48% of West Germany's newsprint consumption was imported, as compared to only 43% in 1958 and 38% in 1957. During the past year, the imported quantity of this grade—at some 229,700 metric tons—nearly equalled the 243,100-ton production. In kraft, an import increase was also observed, reaching 61% of consumption (57% in 1958). Kraft paper imports were 55% more than production.

While half the pulp imports originated in Sweden, the Finnish share dropped from approximately 20% to 16%. However, supplies from the U.S. and Canada rose to 17% from the previous year's 10%. The Austrian share remained unchanged at 9.5%.

In the field of paper and paperboard imports (excluding newsprint), Finland with some 29% and Sweden with about 27% dominated. They were followed by the Netherlands (13%) and Austria (10%). About 60% of newsprint imports were from Finland and Sweden (as in the previous year), another 30% from Austria and Norway.

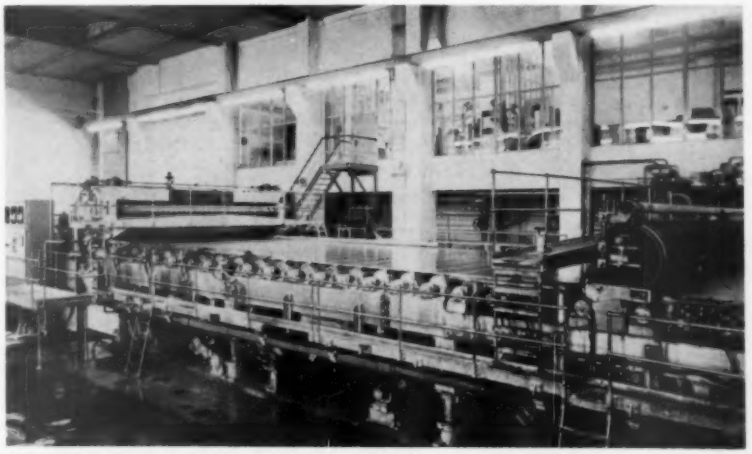
Most from EFTA

With regard to the great European economic areas, EFTA nations provided 63.5% of German pulp imports, Finland 16.2%, the EWG countries 1.4% and various other sources 18.9%. At 17.8%, the EWG share in paper and paperboard was considerably higher; EFTA countries supplied 48%, Finland 28.6% and the remaining nations 5.6%.

Export of paper and paperboard at 78,400 metric tons showed a strong increase from the 70,100 tons of 1958. Exports were valued at 130.5 million DM. Export of pulp was up to 84,600 metric tons from the previous year's 61,600. The value in 1959 was 54.8 million DM.

Accordingly, the export share in paper and paperboard output increased—if only slightly—from 2.4% to 2.5%. In pulp it rose from 9.2% to 12%.

Paper and paperboard exports consisted principally of high-grade



CONTINUED DEMAND FOR MAGAZINE PAPERS in Europe and especially West Germany will be satisfied by this high speed Black-Clawson machine at München Dachauer mill in West Germany.

EUROPE

special papers (49% in quantity, 68% in value). Some 27% of exports were in machine board, 9% in packaging papers.

As in the previous year, 75% of paper and paperboard exports went to European nations. Regarding amount, principal buyers were the Netherlands, Sweden, the United Kingdom, Denmark, Belgium, Switzerland and Austria. As to value, the Netherlands, the United Kingdom and Denmark were in the lead.

In overseas paper and paperboard markets, quantitatively the U.S., Brazil, the Union of South Africa, Australia, Indonesia and India were the principal customers. Value-wise, the U.S., Brazil and the Union of South Africa were leaders.

Some 43% of pulp exports consisted of synthetic fiber pulp, 19% of unbleached sulfite pulp and 32% of bleached sulfite. As in previous years, European countries were the principal recipients.

WEST GERMANY—PAPER PRODUCTION

(In Thousands of Short Tons)

	Woodfree Book and Writing	News	Kraft	Total Paper (Includes other grades)	Paper Board
1949	35	140	123	983	407
1950	69	187	145	1,258	464
1951	64	178	157	1,438	548
1952	68	191	111	1,382	487
1953	86	223	151	1,622	548
1954	100	251	160	1,889	648
1955	101	271	178	2,059	714
1956	100	312	180	2,214	747
1957	108	297	179	2,349	786
1958	116	269	179	2,398	820
1959	130	268	197	2,553	878

WEST GERMANY—WOODPULP PRODUCTION

(In Thousands of Short Tons)

	For Paper Sulfite	For Paper Kraft	Rayon & Dissolving	Straw-Esparto	Total Chem.	Ground Wood
1949	343	3	97	23	466	362
1950	444	1	128	36	610	435
1951	468	1	179	46	694	506
1952	425	1	135	42	603	488
1953	445	1	170	47	663	525
1954	534	—	183	54	771	619
1955	532	—	212	54	798	662
1956	534	—	225	53	812	716
1957	533	—	243	59	835	714
1958	555	—	209	54	818	715
1959	576	—	231	59	866	722

WEST GERMANY—PULPWOOD

(In Thousands of Cords

	Produced	Imported	Total Received	Total Consumed
1950	866	173	1,039	1,032
1951	1,088	311	1,399	1,191
1952	859	305	1,164	1,078
1953	773	235	1,008	1,168
1954	1,063	376	1,439	1,346
1955	1,025	548	1,573	1,374
1956	875	462	1,337	1,405
1957	1,028	364	1,392	1,431
1958	950	341	1,291	1,375
1959	1,055	360	1,415	1,412

WEST GERMANY—PULP IMPORTS AND EXPORTS

(In Short Tons)

Imports

	Sulfate	Sulfite	Mechanical
1955	306,291	125,106	26,069
1956	327,431	133,772	26,784
1957	323,830	174,310	23,551
1958	328,205	158,258	26,231
1959	403,110	179,144	35,156

Exports

	Bleached Sulfite	Unbleached Sulfite	Straw	Dissolving
1955	14,363	19,071	4,944	17,966
1956	9,593	18,469	5,239	20,739
1957	12,330	13,579	7,044	23,620
1958	18,074	19,594	5,768	32,016
1959	32,952	19,489	6,728	44,476

United Kingdom

Steady growth since war culminates in record-breaking year

Population: 51,985,000. Per capita paper and paperboard consumption: 207 lbs.
Paper and paperboard mills: 224; woodpulp mills: 4; straw or vegetable fiber pulp mills: 1 (all mills using straw and/or esparto make their own pulp)

Production	1958	1959 (short-tons)
Paper and paperboard	3,922,746	4,094,912
Chemical woodpulp	15,000	(n. a.)
Mechanical pulp	68,000	(n. a.)
Straw or vegetable fiber pulp	(n. a.)	(n. a.)
Total pulp	145,000(e.)	150,000(e.)
Paper and paperboard imports	1,453,612	1,542,009
Paper and paperboard exports	242,969	222,000
Woodpulp imports	2,354,240	2,495,272

Principal grades made: Newsprint, kraft, sulfite, book and writing, paperboard, tissues, cigaret and fine papers
Principal paper and paperboard exports to: Australia, South Africa, Irish Republic
Principal paper and paperboard imports from: Canada, Finland, Sweden
Principal woodpulp imports from: Sweden, Finland, Norway
(n. a.): not available (e.) estimate.

By F. H. LLEWELLYN THOMAS, M.A., LL.B.

Secretary, British Paper & Board Makers' Assn.

—London

Steady production increases since the aftermath of World War II reached a climax with record-smashing performance in 1959. Only 1952's slight recession interrupted the trend. The interruption, however, was by no means of major consequences.

Output in 1959 was seriously affected by the seven-week labor dispute in the printing industry. Some paper machines were shut down and a shorter work week put into effect. Even now it is probable that the production loss has not been fully met.

However, despite the dispute, 1959 exceeded expectations; there was a considerable order backlog at the end of the year, and favorable conditions in the industry have continued during the opening months of 1960.

Production 6% Ahead of 1958

Total 1959 paper and board production was 3,611,278 British long ton (1 long ton = 1.12 short tons), 6% higher than in 1958 (adjusted to 52 weeks).

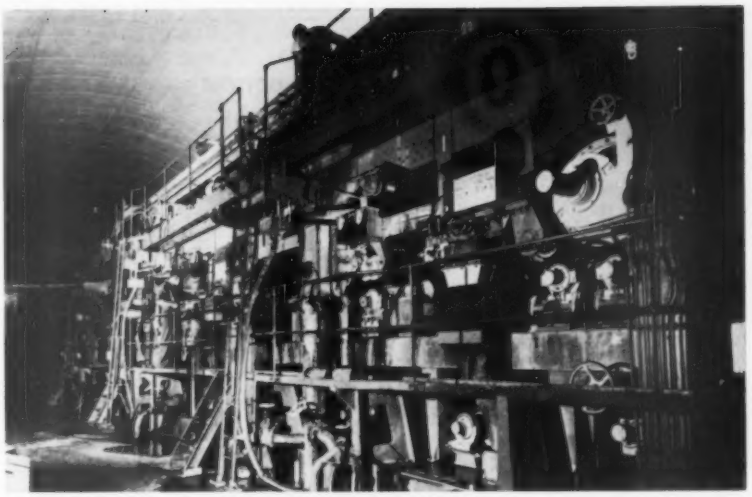
Principal increases were as follows: Newsprint, up 56,359 tons at 671,993; chemical wood papers, up 41,695 at 285,186; kraft, up 43,695 at 312,479; straw paper, up 25,942 at 217,089; other wrappings, up 22,640 at 215,777; industrial and miscellaneous papers, up 10,720 at 97,963, and packaging boards, up 45,669 at 827,789.

Major reductions were recorded in mechanical printing, down 35,029 tons at 280,843, and in wallpaper, down 3,118 at 69,261.

1959 Imports Show 8% Gain

Imports for the year 1959 were 1,413,433 tons, an increase of 8%, slightly above the overall increase for United Kingdom production.

Newsprint led the import list with 509,174 tons, compared with 521,560 in 1958. Packing and wrapping papers were imported at the rate of 346,228 tons, up sharply from the 284,411 of the previous year. Board (including fiber building board) accounted for 454,775 tons, compared with 417,792 in 1958.



SENSATIONAL BRITISH DEVELOPMENT is field of high-speed sheet formation at Bristol mill of St. Anne's Board Mill Co. Ltd. The new Inverform supplements the conventional Fourdrinier wire. Four Inverform units (shown on No. 4 machine above) were built by Walker Bros. (Wigan) Ltd., subsidiary of Walmsleys (Bury) Ltd.

Increased Competition Promised

First impact of the European Free Trade association was not to be felt probably until well after July 1, when the duties were to be reduced. How far this steady reduction of duties, which might be accelerated in the course of years before 1970, will affect the home industry is not at present easily visualized, there being many factors to be taken into account, but undoubtedly competition from all sources will be more strenuous.

Exports in 1959 were 244,705 tons. This represented a rather disappointing decrease of 5%. But, in view of (1) increasingly fierce competition from all quarters of the world, (2) increase in production of paper and board in what have been traditional markets and (3) continuance of rigid quota and currency regulations, this is understandable.

Imported Materials Down Slightly

Imported raw materials for the industry in 1959 amounted to 2,222,000 tons and 72,000 piled cu. fathoms of pulpwood costing £87,000,000, compared with 2,122,000 tons and 56,000 piled cu. fathoms of pulpwood costing £88,000,000 for 1958. Of this total, woodpulp in 1959 was 2,009,405 tons (£83,708,068), compared with 1,919,917 tons (£84,090,921) in 1958.

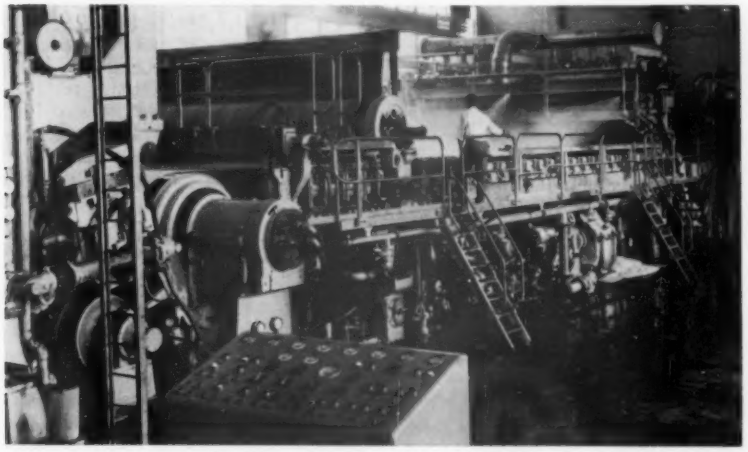
The total esparto imported was 189,632 tons at a value of £2,963,781.

Production of esparto papers for 1959 amounted to 241,634 tons, compared with 246,195 for 1958.

Papers made from rags amounted to 33,864 tons, compared with 33,618 in 1958.

Weekly mill consumption of wastepaper was 23,581 tons against an intake of 23,519, compared with weekly consumption of 22,064 tons and an intake of 21,911 in 1958.

Number of insured workers in the industry was 99,400, compared with 95,400 in 1958.



MODERN PAPERMAKING IN ENGLAND is exemplified by this Walmsleys machine, No. 13 at the sprawling Aylesford operations of the Reed Paper Group, one of the largest diversified paper operations in the world. This machine, 214 in. trim, is making high qualities of printing papers and newsprint at high speeds.

UNITED KINGDOM
PAPER and BOARD PRODUCTION
(in thousands of short tons)

	1939	1946	1953	1955	1956	1957	1958	1959
Newsprint	897	330	676	694	720	731	690	753
Mechanical papers	256	112	294	394	404	356	392	354
Chemical wood papers	233	113	161	253	236	238	273	319
Esparto papers & boards	270	240	243	317	290	284	271	271
Rag & handmade paper	46	41	37	49	44	31	37	38
Kraft	169	151	222	275	275	288	301	349
Other wrapping (mainly food)	68	49	67	76	76	90	81	81
Other wrapping	169	187	221	258	231	298	217	242
Strawpaper	67	47	106	179	182	215	215	243
Building boards	75	53	49	56	59	67	69	69
Other boards	602	517	815	969	979	1,040	1,080	1,138
Wallpaper	49	26	47	62	65	71	81	77
Industrial & misc. papers	45	41	50	65	66	80	98	110
Total	2,946	1,907	2,988	3,647	3,627	3,779	3,805	4,044

UNITED KINGDOM—PAPER and BOARD EXPORTS
(in short tons)

	Newsprint	Other Uncoated Printing	Writing Paper in large sheets	Uncoated Board	Coated Paper	Coated Board	Other Paper & Board & Mfrs.
Av. 1936-7-8	70,985	57,675	13,796	15,103	9,397	2,277	55,414
1946	17,292	20,854	12,606	6,572	12,401	1,888	50,584
1953	139,786	20,595	5,873	8,510	17,020	3,022	85,209
1954	143,033	24,836	6,577	9,975	23,580	5,749	97,005
1955	155,229	28,215	6,831	10,081	26,953	4,537	102,752
1956	152,446	47,888	5,776	11,259	21,778	4,331	56,706
1957	136,377	50,256	4,771	10,308	22,089	6,068	50,806
1958	116,795	47,722	4,899	15,136	21,114	8,194	49,128
1959	90,975	44,151	5,573	19,437	23,619	12,374	77,957

UNITED KINGDOM—PAPER and BOARD IMPORTS
(in short tons)

	Newsprint	Packing & Wrapping	Fibre-Building Board	Other Uncoated Board	Coated Paper	Coated Board	Other Paper & Board & Mfrs.
Av. 1936-7-8	495,644	303,292	32,672	403,184	7,771	26,790	53,300
1946	116,584	81,547	40,824	105,029	564	3,222	17,300
1953	262,050	154,625	73,613	239,872	615	2,180	20,345
1954	366,242	238,156	139,966	368,778	730	3,784	33,079
1955	451,143	302,294	188,422	433,377	727	3,898	37,001
1956	537,138	252,814	161,326	333,857	1,031	2,799	36,000
1957	554,034	290,331	207,548	362,098	1,396	2,998	39,211
1958	584,064	310,901	188,295	332,016	1,200	3,764	41,460
1959	570,274	387,775	234,917	267,109	3,067	7,319	112,579

Demand on Upswing

The tendency towards the end of the year—a tendency which has been accelerated in 1960—has been for order books to improve and delivery dates in the grades that are in particular demand to lengthen, although competition from abroad continues to be very great.

The new capacity that has come into being in the last year or two here and overseas will be undoubtedly able to cope with these increased demands.

Wrappings and packagings and boards of various kinds with few exceptions show a very brisk demand, and there seems to be no reason to anticipate any falling off in the first part of 1960. Printings of most kinds are also in demand; machine-coated papers, banks and bonds and woodfrees especially so.

It is gratifying to note that demand for Esparto papers has also improved.

Undoubtedly, there was some effect on newsprint because of the printing dispute, but here again there has been a definite improvement in demand.

The conversion side of the trade also shows a very brisk and continuing demand.

If the rest of the year continues on the lines of the first three months, there seems to be no reason why another record should not be broken.

New Pulp Mill for Scotland

Approval in principle has been granted Scottish Pulp (Development) Ltd. for construction of a £5,000,000 woodpulp mill, possibly near Fort William in the Highlands. Raw material will consist of softwood thinnings from reforested areas.

Sandwell International Co., Canadian consulting engineering firm, made the basic study and recommended that to be economical the mill should have an annual capacity of 70,000 to 100,000 tons.

The project is backed by the Wiggins Teape Group, Thames Board Mills, Bowater Paper Corp. and the Reed Paper Group. (Scottish Pulp was formed in 1959.)

Part of the wood supply may also come from waste or thinnings of Scottish sawmills. The plant will be Scotland's first chemical woodpulp mill. Several mills produce pulp from esparto grass imported from Africa, but their number has been decreasing in recent years.

ANOTHER RECORD YEAR in the United Kingdom is forecast by F. H. LLEWELLYN THOMAS, (above) M. A., LL. B., secretary of both the British Paper & Board Makers' Assn. and Paper Makers' Straw Trading Co. Mr. Thomas headquarters in Melbourne House, London, is sometimes called the "pulse" of the British industry.

Expansions Keep Pace

British firms have maintained pace with the growing demand. Typical of 1959 expansions were those of:

C. Townsend Hook & Co Ltd., which installed a Fourdrinier machine at its Snodland, Kent mill for manufacture of magazine printings at a maximum of 1200 ft. per min. The Black-Clawson International unit has a trim width of 168 in.

Reed Corrugated Cases Ltd., which installed a 300-ft. board machine at its Brentford, Middlesex plant. New equipment will increase production of wide corrugated fiberboard "by many millions of square feet per week."

Clyde Paper Co. Ltd., which installed a Jagenberg coater at the Rutherglen mill. Unit is believed to be largest, most modern of its kind in Europe.

Not at Full Potential

Addressing the 1959 annual general

meeting of Albert E. Reed & Co. Ltd., the Rt. Hon. Lord Cornwallis of Linton K.B.E., M.C., chairman had this to say:

"World paper and board production is still materially in excess of world demand, and we have not been able to take up the full production potential of the new paper machine at Aylesford (see picture) and the new board machine at Colthrop. . . . The Reed Group is in a position to expand its output very substantially on resumption of full demand."

UNITED KINGDOM—IMPORTS OF RAW MATERIALS

	Roundwood (piled cu. fathoms)	*Woodpulp Paper Grades (short tons)*	*Woodpulp Dissolving (short tons)*	*Esparto, Grasses (short tons)*	*Rags (short tons)*
1938	102,305	1,812,116	88,903	348,556	16,781
1954	86,201	1,883,702	264,505	347,669	23,965
1955	85,046	2,225,420	285,902	339,826	33,199
1956	82,256	2,227,238	237,485	253,507	23,587
1957	87,896	2,164,146	231,325	211,287	21,731
1958	55,752	2,135,438	218,723	206,154	20,392
1959	71,806	2,250,533	273,566	212,387	26,203

UNITED KINGDOM—RAW MATERIALS AND PAPER

Thousands of Short Tons—Source: Board of Trade

	Consumption							*Newsprint*		*Total Paper*	
	Pulpwood	*Woodpulp*	*Esparto*	*Rags*	*Straw*	*Waste Paper*	*Paper Produced*	*Imports*	*Exports*	*Imports*	*Exports*
1938								491	62	1,177	193
1939							2,894				
1946	113	995	100	147	321	680	1,908	114	16	357	126
1949	230	1,272	386	152	93	844	2,475	199	66	509	199
1950	332	1,724	330	146	107	965	2,835	151	111	736	298
1951	n.a.	1,983	389	152	168	998	3,100	171	95	973	265
1952	n.a.	1,608	238	119	136	890	2,750	261	73	635	219
1953	94*	1,670	266	132	134	1,024	2,988	275	139	753	280
1954	89*	1,868	366	155	140	1,170	3,391	366	143	1,151	311
1955	82*	2,071	337	159	145	1,228	3,647	451	155	1,416	334
1956	175	2,064	293	149	111	1,189	3,603	537	152	1,163	299
1957		2,176	224	146	64	1,228	3,712	554	136	1,259	263
1958	160*	2,233	209	143	53	1,310	3,923	584	117	1,462	293
1959	272	2,303	222	139	40	1,369	4,095	570	91	1,583	274

* In addition to this tonnage of pulpwood, there were 72,320 piled cu. fathoms of "roundwood" in 1953; 86,320 in 1954, 78,900 in 1955, 74,940 in 1958 and 74,360 in 1959.

France

Industry prospects high as general economy improves

Population: 44,600,000. Per capita paper consumption: 115 lbs.
Paper and paperboard mills: 284. Woodpulp mills: 48. Straw or other vegetable fiber mills: 6

Production	1958	1959
	(short tons)	
Paper and paperboard	2,409,600	2,575,700
Chemical woodpulp	513,700	587,200
Mechanical or groundwood pulp	455,400	519,300
Straw or vegetable fiber pulp	37,800	41,700
Paper and board imports	251,900	135,000
Paper and board exports	97,900	131,900

Principal paper grades made: Newsprint, 628,400; kraft, 251,900; sulfite and wrapping, 645,800; book and writing, 515,700; tissues and cigaret, 63,900; specialties and fine papers, 88,400; paperboard and strawboard, 381,600.
Principal paper imports from: Finland, Sweden, Norway, Algeria, USSR, Belgium
Principal paper exports to: West Germany, Algeria, Belgium, Tunisia, AOF
Principal pulp imports from: Sweden, Finland, Norway, USSR, U.S.A., Canada
Principal pulp exports to: United Kingdom, Italy, Switzerland, West Germany, Belgium

By FERNAND PORCILE
L'Assoc. Fédérale des Syndicats de Producteurs des Papiers, Cartons et Celluloses
—Paris

Paper and board prospects for 1960 are brighter than ever, reflecting the overall improvement in France's general economy. The external trade balance deficit has been decreased from $115 million in 1958 to $11 million in 1959. In the paper and board industry, production for the first quarter of 1960 was up 13% over the same period in 1959, with a 9% increase indicated for the second period.

Tonnagewise, the industry produced 737,440 tons for the first three months of this year. In 1959, the same period showed production of 652,215 tons. According to experts the second quarter should produce some 725,550 tons (up 9%), the third 590,000 tons (up 8%) and the last quarter 735,000 (up 4%.) This totals a year-end figure of some 2,788,000 short tons, an overall increase of 8%.

In the foreign trade field, exports and imports of paper and board also showed an upward trend. Overall exports totalled 558,464 short tons in the first quarter against 28,449 tons in the first period, 1959. Principal grades exported were woodfree writing and printing grades, 9,611 short tons; newsprint, 8,966 tons; and straw paper and board, 3,663 tons, most of which went to West Germany, Belgium, Algeria and Tunisia.

Although imports of newsprint reduced almost 3,000 short tons, over all imports during the first period were up nearly 40% due to important purchases of kraft paper and board. It is interesting to note that 80% of French imports of newsprint, paper, board and pulp came from Scandinavia.

Significant changes were noted during the past year in the economic ex-

ONE OF PIONEERS in neutral sulfite semichemical pulping is this French mill, La Papeterie de Moulin-Vieux, one of 34 mills in Dauphiné province, where there is a plentiful resource of hardwoods.

changes made between France and the Common Market and European Free Trade Area countries. In the Common Market, France continues to export mainly to West Germany with lesser amounts going to Belgium, Italy and Netherlands. Sweden and Norway continue to be France's main sources of import from European Free Trade Area countries.

In 1959, sales of paper and board totalled 14 billion francs ($28 million) and were 16% higher than the previous year. Part of this increase was due to the new high speed machine which went into operation at the Lancey mill. Actually, sales were up only 9% in the first half of the year, before this machine went into full production. In October, French production reached a new high, just over 242,000 short tons and final overall production was an impressive 2,575,-700 tons.

New records were also experienced by the Facture mill where unbleached kraft pulp production increased 12% over 1958. Current expansion in this mill is expected to push this figure even higher by the end of 1960.

Total production of market pulp in 1959 for both the paper and textile industries at the Tartas mill was 52,-000 short tons, a 10% increase over the previous year.

In all, this added up to an extremely impressive picture. French mills produced 1,147,935 short tons of pulp

FRANCE: PAPER PRODUCTION

(in thousands of short tons)

	Straw Paper	*Kraft, Other Coarse*	*News, Writing, Printing*	*Strawboard*	*Other Board*	*Thin Paper Specialties*	*Total*
1953	104	367	720	32	280	74	1,577
1954	125	400	822	9	338	97	1,791
1955	133	461	888	10	373	110	1,975
1956	152	515	935	12	407	120	2,141
1957	168	574	970	16	454	137	2,319
1958	189	615	1,009	12	436	147	2,409
1959	137	723	1,143	10	424	138	2,575

FRANCE: 157 Years of Paper

Annual Production of Paper and Board
(in short tons)

Year	*Tons*
1800	22.000
1850	55.000
1900	450.000
1914	900.000
1938	1.289.000
1950	1,450,270
1951	1.719.950
1952	1.358.500
1953	1,576,000
1954	1.792.000
1955	1,972,850
1956	2,140,900
1957	2,318,800
1958	2,409,169
1959	2,575,155

FRANCE—PULP PRODUCTION

(in short tons)

	1959	*1958*
Groundwood	459,108	413,362
Semichemical	60,075	41,557
Unbleached sulfite	131,835	131,174
Unbleached sulfate	190,257	170,085
Bleached softwood	113,316	90,389
Bleached hardwood	145,504	116,513
Esparto	32,849	28,329
Straw (bleached)	8,928	9,148
Dissolving	62,831	56,217
Miscellaneous	6,063	5,622
Total	1,147,935	1,006,179

FRANCE—PAPER AND BOARD PRODUCTION

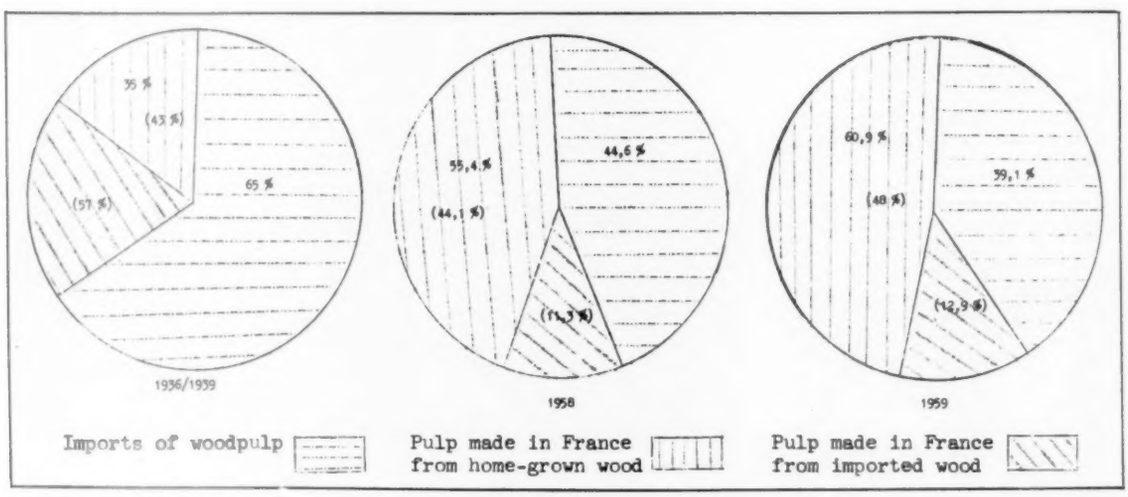
(in short tons)

	1959	*1958*
Newsprint	506,066	371,468
Printings & writings	637,901	638,156
Kraft	251,655	248,109
Wrappings	572,270	555,300
Boards	434,963	448,416
Miscellaneous	152,300	147,720
Total	2,575,155	2,409,169

FRANCE: WOODPULP

(in thousands of short tons)

	Chemical		*Mechanical*	
	Produced	*Consumed*	*Produced*	*Consumed*
1938	148		230	
1950	261	606	320	420
1951	305	691	349	497
1952	226	510	308	396
1953	258	590	326	408
1954	311	664	369	471
1955	379	809	378	504
1956	415	815	396	518
1957	465	844	418	529
1958	533	960	454	560
1959	628		519	



CONSUMPTION OF WOODPULP IN FRANCE—1936-1959

and 2,575,155 short tons of paper and board. This represented a 14% increase in pulp and a 6.9% increase in paper and board over 1958. Some remarkable increases were made in semi-chemical pulp—44.5%; bleached softwood pulp—25.3% and bleached hardwoods—24.8%.

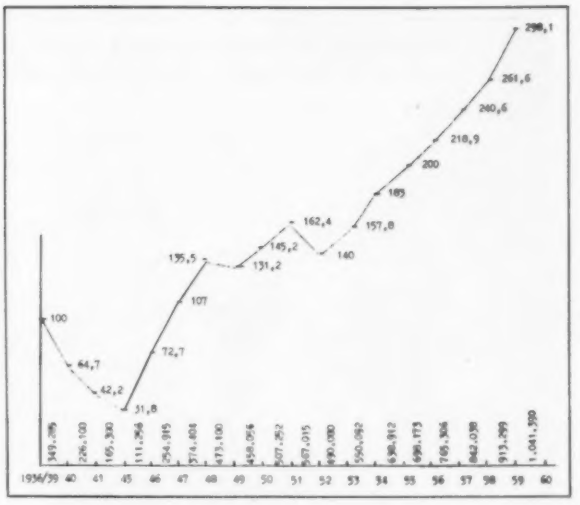
Newsprint production was up 371,468 tons in 1958 to 506,066 tons during the past year. Printing and writing papers were off slightly, less than 2,000 tons, and kraft papers and wrapping were both up a few thousand tons. Largest decrease was in paperboard, which decreased from 448,416 tons to 434,963 tons.

One of the most important recent announcements concerning the growth of the French industry is the merger of two major paper companies, Société Sopalin of France and Kimberly-Clark Corp. of U.S.A. The American firm has acquired major ownership in the company and upon approval of French Exchange authorities, converting equipment will be added to the mill after which K-C's famous Kleenex tissues, now imported, will be produced here. K-C also owns interests in two French cigaret and fine paper mills in Brittany. The balance of Société Sopalin is the property of S.A. des Papeteries Darblay, one of France's biggest paper manufacturers.

At the Sainte Marie mill (in the Champagne region) an expansion program which includes a new 30-ton steam boiler and a 3000 kw turbogenerator has been completed enabling full production on three paper machines, one of them making machine-coated papers.

Arches mill (Vosges region) has begun erection of a plant which will use machines producing papers impregnated with thermosetting synthetic resins. A recent stock increase will partly finance a new thin paper and specialties machine at Rives.

PRODUCTION OF WOODPULP in France for Paper and Textiles



Sweden

Four new mills were initiated during the past year

By DR. OLLE ANDERSSON
Editor for Sweden

–Stockholm

Major events in the Swedish pulp and paper industry during 1959 were the start-up of the No. 2 paper machine at Ortviken (Swedish Cellulose) and the completion of the brand new continuous kraft mill at Mönsterås (Skogsägarna).

The second newsprint machine at Ortviken is a close copy of the No. 1 machine, built by Karlstads Mekaniska Werkstad. With this machine the third twinver press in Sweden went into operation. In contrast to this is the newsprint machine of the same size started at Hallstavik the year before. This incorporates a simpler press arrangement without the third press roll. It was built by Voith of Germany. With both systems certain advantages are claimed.

The Mönsteras kraft mill, a coop-

Population: 7,460,000. Per capita paper and paperboard consumption: 232 lbs.
Paper and paperboard mills: 67; Woodpulp mills: 82

Production (short tons)	1958	1959
Paper and paperboard	1,857,000	2,054,000
Chemical woodpulp	3,517,000	3,759,000
Mechanical woodpulp	977,000	1,086,000
Total woodpulp	4,494,000	4,845,000
Paper and paperboard imports	20,000	22,000
Paper and paperboard exports	1,055,000	1,209,000
Woodpulp exports	2,598,000	2,953,000

Principal paper grades made: Newsprint, 557,000 tons; kraft papers, 523,000 tons; paperboard, 334,000 tons
Principal paper and paperboard exports to: West Germany, U.K., Denmark, Netherlands, Brazil
Principal woodpulp exports to: U.K., West Germany, France, U.S.A., Italy

MODEL OF NEW LINERBOARD MILL and other additions being constructed in northern Sweden at Munksund by Swedish Cellulose Co. This is one of four major linerboard and corrugating board mills being built in Scandinavia to meet Europe's increasing need for fiber boxes. This will have a Beloit 248 in. wide machine with secondary headbox. Pulping facilities are being increased 50%. A new boiler and turbine are being added. Note dock with cargo ship and pulpwood stacks in the foreground.

SWEDEN'S WOODPULP EXPORTS TO ALL COUNTRIES AS COMPARED WITH EXPORTS TO THE UNITED STATES

(In Short Tons)

Years	Bleached Sulfite	Unbleached Sulfite	Bleached Sulfate	Unbleached Sulfate	Ground-wood	Dissolving*
1938 (To All Countries)	304,078	571,077	92,793	575,508	297,420	
1944 (To All Countries)	156,340	710,709	13,088	70,889	10,600	
1945 (To All Countries)	262,146	49,787	43,273	536,114	314,054	
1945 (To U. S.)	56,496	283,959	28,070	274,429	27,933	
1950 (To All Countries)	632,082	609,404	250,326	501,324	312,224	
1950 (To U. S.)	49,350	99,562	89,663	103,932	12,763	
1951 (To All Countries)	601,114	526,089	267,647	455,863	326,661	
1951 (To U. S.)	30,522	51,344	71,765	58,562	6,767	
1952 (To All Countries)	490,747	406,386	248,861	352,272	296,231	
1952 (To U. S.)	26,776	61,356	72,714	41,855	12,634	
1953 (To All Countries)	385,133*	584,020	355,787	521,267	341,105	409,782
1953 (To U. S.)	45,262	79,408	106,635	65,091	14,744	3,773
1954 (To All Countries)	273,680	574,310	337,370	465,630	396,000	407,440
1954 (To U. S.)	22,330	44,110	88,330	49,170	13,403	1,320
1955 (To All Countries)	329,699	557,097	346,698	475,246	424,101	405,146
1955 (To U. S.)	18,706	27,772	81,744	54,825	9,313	28
1956 (To All Countries)	403,176	553,990	402,137	556,261	475,923	416,208
1956 (To U.S.)	23,006	36,672	86,555	61,058	6,598	—
1957 (To All Countries)	392,347	527,573	416,645	500,735	455,128	419,594
1957 (To U.S.)	19,741	21,899	65,093	40,995	1,123	121
1958 (To All Countries)	439,319	456,839	498,694	460,489	380,446	362,589
1958 (To U.S.)	26,474	33,037	75,720	40,902	7,456	—
1959 (To All Countries)	513,670	459,181	607,024	599,287	397,111	376,702
1959 (To U.S.)	57,853	41,809	90,575	76,951	9,239	1,671

* *From 1953, dissolving grades are listed separately.*

SWEDEN—Pulp Produced

(In thousands of short tons)

	Mech.	Sulfite Bleached	Sulfite Unbl.	Dissolving	Sulfate Bleached	Sulfate Unbl.	Total Chem.
1937	809	514	1,290		96	1,176	3,076
1946	747	556	802		132	777	2,267
1950	794	735	831		272	869	2,712
1951	800	772	858		319	904	2,853
1952	751	698	774		327	793	2,592
1953	612	442	756	322	342	771	2,777
1954	850	456	850	404	426	985	3,121
1955	937	516	896	413	450	1,046	3,321
1956	1,020	568	925	411	480	1,113	3,493
1957	1,058	612	849	458	526	1,164	3,609
1957	1,059	612	849	458	526	1,164	3,609
1958	977	657	825	392	585	1,058	3,517
1959	1,086	700	797	397	692	1,173	3,759

THIS MILL MADE HISTORY IN SWEDEN. Skogsagarans Cellulosa AB (Forest Owners Cellulose Corp.) at Monsterås in southern Sweden has set a pattern now followed elsewhere in Scandinavia. Some 6000 private forest owners and farmers own the mill and 15 million acres of forest land, or have rights to the land. The mill makes bleached and unbleached kraft pulps continuously with Kamyr digesters. Pulp mill is framed behind conveyor to chip silo.

DR. PER OLOF ANDERSSON, our editor for Sweden, is better known in Sweden as Dr. Olle Andersson. He is assistant to Dr. Borje Steenberg, head of the paper technology department at the Swedish Forest Products Research Laboratory. He is also technical editor of Svensk Papperstidning (Swedish Paper Journal), the official organ of the Swedish Paper Mills Assn., the Swedish Assn. of Pulp and Paper Mill Engineers and the Swedish Assn. of Forest Tree Breeding. He graduated in 1948 from the Royal Institute of Technology in Stockholm. He earned his doctor's degree at the Royal Institute in the special studies of engineering physics.

erative enterprise owned by wood growers and farmers, was officially opened June 1 in the presence of members of the government. It will soon be followed by another large pulp mill on the Mörrum river, manufacturing kraft pulp partly from hardwoods. The Mönsteras mill was designed for a production of 70,000 tons per year and is unusual in many respects. The buildings were assembled from concrete building elements. Although gigantic, their volume is only 6% of that of the Cheops pyramid in Egypt. This mill was the first kraft mill built in Sweden in 27 years.

These events are symptomatic of the times. Last year four major projects were initiated: The Mörrum mill just mentioned, the Nymölla mill in southern Sweden using the Magnefite sulfite process on hardwoods and the new kraft mills in Northern Sweden for Swedish Cellulose at Munksund and for Statens Skogsindustrier (Swedish Government) at Piteå. The former increases its kraft pulping and incorporates a kraft liner machine, the latter extends kraft pulping, incorporates semi-chemical pulping and 105,000-ton liner machine.

Major Trends

These enterprises depict the major trends: Increased newsprint manufacture, increased linerboard manufacture and utilization of the country's hardwood resources applying new processes.

The increased newsprint production has been discussed over and over again and needs no further comment. Still, an even greater increase in demand is anticipated and a new machine is planned by Holmens Co. at Hallstavik, a machine similar to the one just started.

The increased demand for liner board is probably indicative of the increased standard of living in the world: The higher the standard of living the higher the consumption of unit packages, it is claimed, and the main ingredients in unit packages are corrugated medium and linerboard.

Hardwoods Key to Expansion

The two great forest surveys carried out in Sweden during the last few years indicate an available surplus which had not been anticipated. Especially great is this surplus, if decidious woods are included. Earlier these species were considered more or less worthless, but with the advent of the high yield pulping process, using other cooking chemical bases than the conventional calcium, combined with the applicability of such products in manufacture of unit packages, these resources have become of unexpected value. Utilization of hardwoods has, therefore, been adopted at several mills, and particularly the two entirely new mills in southern Sweden, whose construction has just started.

Application of new chemical bases is also developing in other chemical fields. Thus, the Stora Kopparberg 2-stage soda base process has been adopted by the Mo & Domsjö Co. at Örnsköldsvik. As part of a reconstruction program extending over several years, it has adjusted its pulping process to the utilization of sodium as a base in the manufacture of sulfite pulp from pine.

In view of the great increase in demand predicted in the extensive FAO forecasts at the Rome Conference in 1959, combined with the EFTA development, other considerable extensions in manufacturing facilities can be expected.

A semi-chemical process of Swedish origin has come into operation at a few places during the last few years. The method implies application of chemicals in combination with the Asplund Defibrator process. It has been successfully used for high yield birch in combination with groundwood and sulfite pulp for newsprint and for corrugating medium of other hardwoods. The method will be adopted at other places in the near future.

Paper Sales Going Up

The paper market situation is satisfactory, sales are increasing and demand is up to expectation. The production capacity of newsprint is still slightly higher than demand, although the situation is improving.

During the first quarter total paper and board export was 320,000 tons

NEARING COMPLETION IN STOCKHOLM is Forest Industry House, which will house such groups as Swedish Wood Exporters' Assn., Swedish Paper Mills Assn., Swedish Cellulose & Wood Pulp Assn., Swedish Wallboard Manufacturers' Assn., the Swedish Paper Journal and the Swedish Assn. of Pulp & Paper Engineers. Designer of the building is Sven Markelius, famed Swedish architect who cooperated in designing the UN Building in New York, U.S.A.

SWEDEN—Paper Exports

(In thousands of short tons)

	News	*Kraft*	*Sulfite Wrapp'g*	*Greasepr'f Parchm't*	*Board*	*Total (Includes all other grades)*
1937	222	202	128	24	69	694
1946	141	147	82	18	61	493
1950	226	256	105	30	130	816
1951	222	261	110	29	124	811
1952	240	192	61	21	67	624
1953	227	262	76	26	126	784
1954	213	314	88	27	154	868
1955	218	343	92	29	155	916
1956	275	376	89	31	157	1,013
1957	297	380	94	30	170	1,081
1958	306	346	90	28	163	1,055
1959	355	402	96	29	198	1,209

SWEDEN—Paper and Board Produced

(In thousands of short tons)

	News	*Kraft*	*Fine*	*Board*	*Total (Includes all other grades)*
1937	303	249	79	125	1,004
1946	290	254	110	162	1,074
1950	358	345	112	210	1,301
1951	366	369	133	231	1,401
1952	365	306	122	157	1,202
1953	372	371	123	207	1,352
1954	373	442	137	260	1,536
1955	397	469	155	264	1,643
1956	457	488	167	265	1,733
1957	476	510	191	287	1,853
1958	498	470	179	293	1,857
1959	557	523	187	334	2,054

EUROPE

against 255,000 tons last year. Sales on the domestic market were during the same period 206,000 tons (176,000). Total production increased to 557,000 tons (455,000). This large increase is due to better utilization of production capacity as well as start-up of two new units.

The overseas export is unchanged. Abolishment of import restrictions in Australia is expected to improve this market in the near future. Deliveries to Great Britain are higher, and this is also true for the EEC states except France where the franc devaluation has prevented appreciable changes. The future of the EEC trade is uncertain and is entirely dependent upon the EEC-EFTA negotiations.

Exports to the EEC countries have increased for all products and not only paper. Export to West Germany during the first part of this year was 60% larger than in the same period last year.

The Outlook For Swedish Market Pulp: Mr. Sjunnesson's View

Speaking for the Swedish Cellulose and Mechanical Woodpulp Association, Lars Sjunnesson, its managing director, recently observed that there has been a considerable improvement in the world markets and he predicts that Swedish and other producers of market pulp will benefit.

A new record of more than 2.5 million tons of chemical pulp production for export and domestic markets was set in 1959 and for this year, 1960, full utilization of added capacity could bring production of market pulp to 2.7 million tons—that would be the pulp sold abroad and in home markets.

Mr. Sjunnesson predicted a high operating ratio in 1960. He anticipates more integration in North America, thus taking some of its surplus pulp off the market. The position of the Swedish cellulose industry in 1960 "seems relatively favorable from a purely quantitative point of view." But the pulp price situation, he said, has not been good, and there have been declines in price while cost of pulpwood and wages are going up.

The world markets, he said, will not absorb total capacity in mechanical pulp of the Scandinavian countries. However, there will be some increase in sales, and the overcapacity problem will be lessened, said Mr. Sjunnesson.

A spokesman for Scandinavian producers, Per Westad, president of the Pulp Importers group in U.S.A., said total woodpulp production of the Scandinavian countries will be increased by 5,000,000 tons in the next five years. This will be for domestic use as well as export.

It is recognized in Sweden that the future of pulp marketing is tied with negotiations affecting the future destinies of the European Free Trade Association and also that "inner" group of nations—the European Common Market or Economic Community. But Swedish producers are highly optimistic.

NILS J. LINDBERG, editor for Finland, heads the technical department for the Finnish Paper Mills Association. He is also an editor of the Finnish magazine, Paper and Timber.

Finland

More new machines ordered in 1959 than ever before

Population: 4,413,000. Per capita paper and paperboard consumption: 159 lbs.
Paper mills: 25; paperboard mills: 15; fiberboard mills: 8; sulfite pulp mills: 20; sulfate pulp mills: 9; mechanical woodpulp mills: 23

Production	1958	1959
	(short tons)	
Paper and paperboard	1,750,000	1,881,000
Chemical woodpulp	2,292,000	2,388,000
Mechanical woodpulp	923,000	917,000
Wallboard pulp	160,000	190,000
Total pulp	3,375,000	3,495,000
Paper and paperboard exports	1,420,000	1,520,000
Woodpulp exports	1,482,000	1,608,000

Principal paper grades made: All kinds.
Principal paper and paperboard exports to: West Germany, United Kingdom, U.S.A., U.S.S.R., Denmark, the Netherlands, Belgium, Brazil, France, Argentina
Principal woodpulp exports to: United Kingdom, France, U.S.A., West Germany, the Netherlands, Brazil, Italy, U.S.S.R., Poland, Belgium

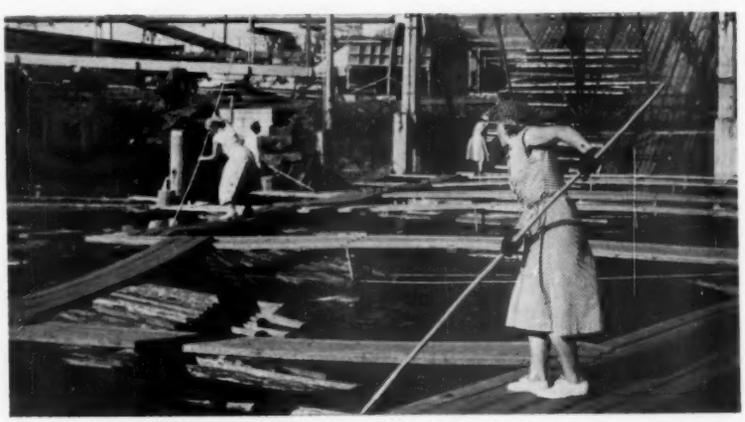
By NILS J. LINDBERG
Editor for Finland

—Helsinki

The end of 1959 marked for the Finnish pulp and paper industry the turning point in the price curve. Chemical pulp prices had especially been affected by declining demand during the worldwide recession. The average drop in export prices of chemical pulp from the first quarter of 1958 to the third quarter of last year was nearly 15%. For the entire industry the corresponding figure was 10%.

In the fourth quarter of 1959 the price decline came to a halt, and by year's end price curves were already bending upwards.

Demand is also picking up, and the export market for pulp and paper is —generally speaking—quite satisfactory. The first quarter of 1960 shows a considerable increase (about 20%) in the volume of pulp and paper ex-



LOGGING IN FINLAND utilizes extensive waterways of that country. Here, at Voikka Sulphite Mill, women workers steer logs onto transport which conveys them into the mill. (United Nations photo)

ports as compared to corresponding 1959 figures.

A Creative Pause

Technologically, 1959 was a creative pause. New paper machines were put into operation; but, more importantly, more units were ordered than in any other year of the Finnish industry's history.

Current modernizations at the mills emphasize (1) improvement in wood preparation; (2) an increase in bleaching capacity, and (3) savings in heat and power economy.

New in Finland is the air-borne pulp dryer; the first one of its kind was built during 1959, and several are on order.

On the home market the success of bleached board containers for dairy products exceeded expectations. Glass has been forced to give ground to milk bottle board.

40% Increase for 1963

Expansions either now in work or announced for the near future indicate that by 1963 primary pulp-producing capacity will be some 40% above the present level. Of this, about half will be sulfate, somewhat less than 20% sulfite, somewhat more than 20% groundwood and less than 10% semichemical. More than half the pulp capacity increase will be converted into paper and paperboard.

Optimism Among Exporters

Overall, 1959 was a favorable year in Finland. Growth in total industrial output was some 6% more than in 1958, while exports increased about 14% in volume and some 6% in value. Increased export volume more than compensated for lower prices.

Chemical pulp (sulfite and sulfate) exports were somewhere between 1,300,000 and 1,350,000 metric tons, compared to 1,200,000 in 1958. Paper and board exports were expected to pass the 1,350,000-ton mark (1,288,000 in 1958). Both figures are all-time peaks.

Pulp and paper's confidence in development of market position and world demand was reflected in pulpwood-felling statistics for the first half of the current season. These show a substantial (14%) increase. However, demand for Finnish paper has not yet reached capacity in every field. Newsprint, for instance, was at less than 80% of capacity early in 1960. Still, this is considerable improvement over a year ago.

Around the Finnish Mills

A fourth paperboard machine has been ordered for the Kaukopää mills of Enso-Gutzeit Oy. Building the unit are Beloit Iron Works (U.S.A.) and Beloit Italia (Italy). It will have an annual output of 85,000 to 140,000 tons, depending on grades made.

Oy Kaukas AB is building an evaporation and steam boiler plant. Evaporation effect will be 80 tons waste liquor per hour; boiler capacity, 80 tons steam per hour. Some 80% waste liquor is to be burned as fuel.

G. A. Serlachius Oy has ordered a Beloit Iron Works (U.S.A.) crepe machine for its Mantta mills. Unit will operate at 2,500 fpm, will replace three older machines.

Kemi Oy at Karihaara is installing a Kr 10,000,000 boiler plant, said to be the largest of its kind in the world. Supplied by Götaverken, it is to be

FINLAND—Pulp Produced

(in thousands of short tons)

	Mechanical	*Sulfite*	*Sulfate*	*Total Chemical*
1937	904	1,143	483	1,626
1949	659	690	429	1,119
1951	889	905	623	1,528
1952	797	786	488	1,274
1953	877	718	530	1,248
1954	934	955	778	1,733
1955	1,013	1,096	907	2,012
1956	1,082	1,096	953	2,049
1957	1,083	1,184	1,104	2,288
1958	1,083	1,210	1,082	2,292
1959	1,107	1,181	1,207	2,388

FINLAND—Pulp Exports

(in thousands of short tons)

	Mechanical	*Sulfite*	*Sulfate*	*Total Chemical*
1937	321	908	392	1,300
1949	176	495	343	838
1951	231	655	427	1,082
1952	158	525	271	796
1953	225	511	356	867
1954	213	640	413	1,053
1955	201	750	491	1,242
1956	204	748	499	1,247
1957	182	769	523	1,292
1958	158	799	525	1,324
1959	153	849	605	1,454

FINLAND—Paper Produced

(in thousands of short tons)

	News	*Wrapping*	*Writing and Printing*	*Total Paper (Includes other grades)*	*Paperboard Cardboard Wallboard*
1937	463	121	56	669	172
1949	425	107	62	623	173
1951	458	141	122	756	355
1952	480	136	108	755	255
1953	484	178	123	824	332
1954	493	257	143	934	421
1955	602	299	136	968	466
1956	661	321	207	1,216	468
1957	690	348	218	1,285	572
1958	691	338	226	1,285	619
1959	715	395	220	1,387	675

FINLAND—Paper Exports

(in thousands of short tons)

	News	*Wrapping*	*Writing and Printing*	*Total Paper (Includes other grades)*	*Paperboard Cardboard Wallboard*
1937	422	101	45	572	133
1949	384	67	43	502	101
1951	422	87	90	609	238
1952	433	85	78	604	143
1953	443	122	94	671	206
1954	432	183	103	734	267
1955	518	213	137	881	298
1956	592	212	163	980	286
1957	607	252	169	1,046	387
1958	644	235	159	1,072	440
1959	635	304	161	1,171	470

of the Tomlinson type with an hourly capacity of 600-700 tons.

A new newsprint machine with annual capacity of between 70,000 and 80,000 metric tons is planned for the Voikka mill of Kymin Oy-Kymene AG.

A newsprint unit complete with air conditioning equipment and auxiliaries is being installed by Myllykosken Paperitehdas Oy. Delivery contract was signed with Valmet Oy for the 70,000-ton (metric) giant.

Pulp and paper expansion is aim of project underway at the Jamsankoski mills of Yhtyneet Paperitehtaat Oy.

Rauma-Repola Oy has modernized and enlarged its pulp mill.

Kajaani Oy has completed a new bleach plant.

And A. Ahlström Oy is installing a third newsprint machine at Warkaus.

Finnish Pulp Mills — Annual Production — Location

		Tons
1	Kemi Oy (sulfite)	88,000
2	Kemi (sulfate)	152,000
3	Veitsiluoto (sulfite)	125,000
4	Toppila (sulfite)	50,000
5	Oulu (sulfate)	170,000
6	Kajani (sulfite)	102,000
7	Jacobstad (sulfite)	77,000
8	Rosenlew (sulfite)	28,000
9	Rosenlew (sulfate)	70,000
10	Nokia (sulfite)	80,000
11	Enqvist (sulfite)	67,000
12	Serlachius (sulfite)	70,000
13	Yhtyneet—Ilves (sulfite)	65,000
14	Metsäliiton (sulfite)	55,000
15	Haarla (sulfite)	30,000
16	Ahlström (sulfite)	95,000
17	Rauma (sulfite)	75,000
18	Yhtyneet—Walkiakoski (sulfite)	60,000
19	Yhtyneet Walkiakoski (sulfate)	75,000
20	Lohja (sulfate)	36,000
21	Eklöf (sulfite)	44,000
22	Kuusankoski—Woikka (sulfite)	45,000
23	Kuusankoski—Kymmene (sulfite)	120,000
24	Enso-Gutzeit—Kotka (sulfate)	120,000
25	Sunila (sulfate)	160,000
26	Kaukas (sulfite)	83,000
27	Joutseno (sulfate)	100,000
28	Enso-Gutzeit—Tainionkoski (sulfite)	35,000
29	Enso-Gutzeit—Kaukopää (sulfate)	320,000

Russia

Improved technology, modern equipment boost pulp, paper

Population: 210,400,000. Per capita paper and paperboard consumption: 32.4 lbs.
Paper and paperboard mills: 149; Woodpulp mills: 45; Straw pulp mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	3,252,150	3,399,330
Chemical woodpulp	2,302,300	2,405,480
Straw pulp	3,300	3,410
Groundwood pulp	913,000	954,030
Total pulp	3,218,600	3,362,920
Paper and paperboard imports	146,300	125,070
Pulp imports	75,900	70,180
Paper and paperboard exports	103,180	116,600
Pulp exports	240,790	238,700

Principal grades made: Newsprint (440,550 short tons); kraft bagging (239,361); writing (235,642); printing (425,920); packaging (100,266); cigaret (8,800); other papers (1,108,690)
Principal paper and paperboard exports to: Bulgaria, Hungary, China, the Netherlands, France, Turkey, Iran, the United Arab Republic
Principal paper and paperboard imports from: Sweden, Norway, Poland, Czechoslovakia, Finland
Principal pulp exports to: United Kingdom, France, Spain, Hungary, Bulgaria, German Democratic Republic, Czechoslovakia
Principal pulp imports from: Sweden, Norway, Poland, Czechoslovakia, Finland

By V. SHULGIN
and K. H. DJALILOV
Editors for Russia

—Moscow

Soviet pulp and paper is expanding at an ever-increasing pace.

In 1959, first year of the current Seven-Year Plan, production targets in pulp, paper, paperboard and paper products were realized both by the U.S.S.R. and by the individual constituent republics. Paper output totaled 2,326,500 metric tons, against the 2,236,000 of 1958. Paperboard gained well over 40,000 tons, from 720,500 to 763,800; while pulp jumped from 2,093,000 to 2,186,800.

Primarily responsible for the increase were improved technology and modernized equipment. Extensive modernization projects were undertaken during the year, and at two mills an up-to-date method of cooking ammonium-base sulfite pulp was launched. The process permits wide use of deciduous wood and raises digester productivity. Research continued to improve liquor regeneration and increase the acid resistance of sulfite digesters.

1960 Increase Predicted

Deciduous woods (including alder, aspen and poplar) are being used in increasing amounts.

A new 100-ton-per day continuous sulfate unit was put into operation at the Mari mill.

Outmoded barking and chipping equipment continued to be replaced by new units yielding a 10-12% savings in wood over 1958.

Manufacturing process for tropicalized paper and thermo-reaction printing paper were developed and experimental lots of these grades produced.

Four high-capacity impregnating machines for production of two-ply paper bags were placed in operation at the Segezh mill.

K. H. DJALILOV, senior engineer of the Timber, Paper and Woodworking Industry Division of the State Planning Commission (The Gosplan) in Moscow. Mr. Djalilov has been serving for about two years as principal editor in Russia for this magazine. He is co-author of this report with V. SHULGIN. Mr. Djalilov is a pulp and paper engineer and important adviser on the processes and equipment which are being introduced in the U.S.S.R.

According to all predictions, production will increase again in 1960—paper to 2,418,600 metric tons; board to 780,000, and pulp to 2,278,000. For some grades of paper and board the increase will amount to 10-15% and more.

More Than 20 New Mills

In view of growing demand for viscose pulp and the better grades of writing and printing papers, new bleaching plants are under construction, while existing facilities are being expanded.

SPECIAL REPORT FROM RUSSIA

SOVIET EMPHASIZES LOGGING in this painting displayed at recent Soviet trade exhibit.

An extensive building program—exclusive of housing and power plants—is underway at a cost of 1,470,000,000 rubles ($367,500,000 at official exchange rate), as compared to 860,000,000 rubles in 1959 and about 500,000,000 in 1958. (Exchange rates differ in the U.S.S.R., the "official" rate being 4 rubles to one U.S. dollar, and the tourist rate 10 to one.)

New capacities to be commissioned during 1960 include 300,000 metric tons paper, 253,000 pulp and 93,000 board. Special emphasis is being placed on newsprint; printing, coated papers, (Editors Note: Russia is using the Peter J. Massey paper coating process developed at Consolidated Water Power & Paper Co., U.S.A., and now used at Star Paper Mills, U.K., and others), and cable and other paper and board grades, as well as on viscose pulp.

More than 20 mills are being built or are scheduled for 1960. These include three plants utilizing reed grasses (at Astrakhan, Kzyl-Orda and Kherson), a 150,000-ton viscose pulp mill at Kotlas and a 100,000-ton paper and board mill at Krasnoyarsk. New paper machines are to be installed at a number of other plants.

Production Target Is Raised

Statistics for the first quarter of 1960 show overfulfillment of production aims in the major grades and indicate that the Soviet industry will again score a record year.

New organizational and technological measures aimed at increasing output were adopted in April 1960. The original Seven-Year Plan targets for pulp, paper and board production have been raised. Thus, with the revised figures, output in 1965 (last year of the current plan) has been upped for paper from 3,530,000 metric tons to 4,150,000; for board from 2,800,000 to 3,600,000, and for pulp from 4,800,000 to 6,180,000.

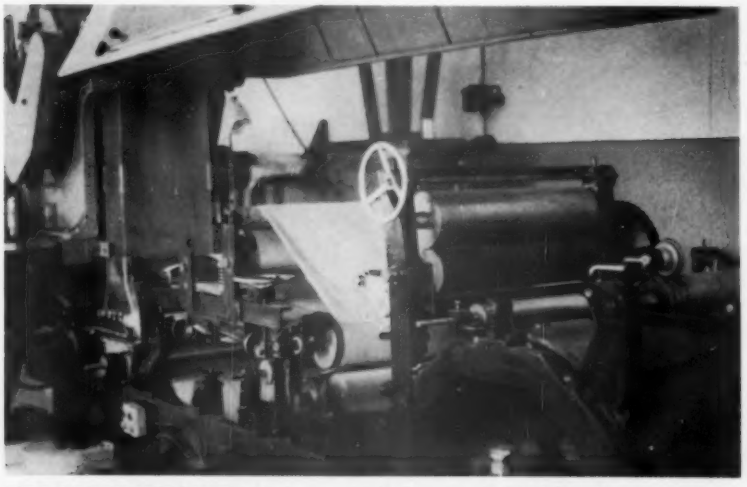
Specifically, output of newsprint will increase 2.7 times in the seven-year period; bag paper, 2.4 times; sanitary, packaging and other papers, 18.8 times, and packaging board, 27.8 times.

The network of research and planning organizations serving the pulp and paper industry is being substantially enlarged. Two new paper research institutes are being established, and branches of the industry's Central Institute are being set up at four of the larger mills and provided with experimental shops.

Measures have also been taken to reinforce the construction organizations; bureaus of design are being set up at major construction sites and enterprises.

Distinctive feature of the pulp and paper industry's general development plan is that it provides for establishment of large integrated wood-using manufacturing combines in the forested areas of the north, the Urals, Siberia and the Far East. At Bratsk, for example, one large combine will produce an annual 280,000 metric tons packaging paperboard, 200,000 tons viscose pulp, 960,000 cu. meters lumber, 100,000 cu. meters pressed shavings slabs and furniture and other goods valued at some 30,000,000 rubles.

The program also provides for construction of medium-sized plants utilizing such perennials as reed grass and straw and wastepaper.



DRY PROCESS PAPER is being made in Russia on this laboratory machine at Central Pulp and Paper Industry Research Institute in Leningrad.

USSR PAPER AND BOARD PRODUCTION

Year	*In Short Tons*
1937	1,073,600
1938	1,080,200
1940	1,059,300
1946	676,500
1947	867,900
1949	1,350,800
1950	1,635,700
1952	2,035,000
1953	2,267,100
1954	2,453,000
1955	2,647,810
1956	2,839,210
1957	3,060,200
1958	3,252,150
1959	3,399,330

Official—especially prepared in Moscow for PULP & PAPER

55% of World Total

It has been estimated by the Soviet Union that Russia possesses 55% of the world's coniferous forests. State policy is said to direct that they be developed as rapidly as economically justifiable. An official spokesman has predicted that in the near future Russia's forest production will exceed that of the U.S.A. and Canada combined.

It is reported that total log production in the U.S.S.R. has risen from 185,000,000 cu. meters in 1947 to some 390,000,000 in 1959; while Canadian output remained relatively stable at 105,000,000, with the U.S. rising slightly to 310,000,000.

Timber Export Encouraged

Reeds and low-quality fast-growing woods have gained enormous favor in the Russian pulp and paper industry, reflecting government policy that encourages export of wood as timber rather than its conversion to pulp.

Addressing a 1959 conference in Vienna, Dipl. Ing. Ferdinand Wultsch called for increased awareness of the Soviet Union's place in the global industry. "There is great demand in Russia for chemicals to make better paper," he said, "and the market for paper machines and auxiliary equipment is large and growing. There are good prospects for those counrties that produce paper machines and allied equipment for export to the U.S.S.R.

Dr. Wultsch is an internationally-known inventor and paper technologist and is gen. mgr. of Arland Padier- und Zellstoffabriken AG, Graz-Andritz, Austria.

Largest Newsprint Machines

Russia has ordered two high-speed newsprint units from Black-Clawson International Ltd., British subsidiary of Black-Clawson Co. (U.S.A.). Cost of the order is more than £4,000,000 ($11,200,000). The machines will be the largest in the Soviet Union and among the largest in the world. Trim width will be 7.2 meters (284 in.) and daily production 330 metric tons (363 short).

Machines from Sweden

First of the paper machines ordered by the Soviet Union from Karlstads Mekaniska Werkstad (Sweden) was being assembled last year. Drying section is 100 meters (328 ft.) long and has a total of 101 drying cylinders and 22 felt dryers, each with a dia. of 1.5 meter (6 ft.) and a length of 4.7 meters (18.6 ft.). Total machine length is nearly 200 meters (656 ft.).

East Germany

Expansion continues but output still insufficient

Population: 17,832,200; per capita paper consumption: 87 lbs.

Production (short tons)	1957	1958
Paper and paper board	775,100	800,700
Chemical woodpulp	360,800	367,800
Mechanical or groundwood pulp	275,000	290,000
Straw or other vegetable fiber pulp	47,300	49,500
Woodpulp imports	42,900	—

Principal paper exports to: Russia, Bulgaria

—Berlin

Despite a continuing program of expansion and modernization, East Germany's paper and board production is still inadequate for the demands. Under its recently completed five-year plan, woodpulp and paper were both increased, but pulp imports are still gaining, are up 50% over 1955.

If East Germany's plans for the next five years are to be met it will mean a sweeping change in its production —or even sharper gains in imports. Under the recently announced plan for the next half-decade, per capita production is to increase from its present 103 lbs. to 180 lbs. by 1965.

Emphasis seems to be on just about all grades, particularly wrapping, printing, writing, shipping and boards of all types. Quality is particularly under scrutinization and all types of paper products are constantly being upgraded.

Austria

Production is increasing but proceeds lag behind

Population: 7,050,000. Per capita paper consumption: 88.66 lbs.
Paper and paperboard mills: 90. Woodpulp mills: 61

Production	1958	1959
	(short tons)	
Paper and paperboard	572,676	589,721
Chemical woodpulp	470,614	483,661
Mechanical or groundwood pulp	168,843	170,446
Straw or other vegetable fiber pulp	1,629	122
Paper and board imports	15,118	20,996
Paper and board exports	297,922	306,189
Woodpulp imports	22,190	41,723
Woodpulp exports	219,149	229,620

Principal paper grades made: newsprint: 151,270; kraft: 62,821; sulfite: 63,484; book and writing: 167,486; paperboard: 98,810; tissues: 44,931; cigaret and fine papers: 919.
Principal paper imports from: West Germany, Poland, Sweden
Principal paper exports to: West Germany, Italy, Hungary
Principal pulp imports from: West Germany, Sweden, Hungary
Principal pulp exports to: Italy, West Germany, Switzerland

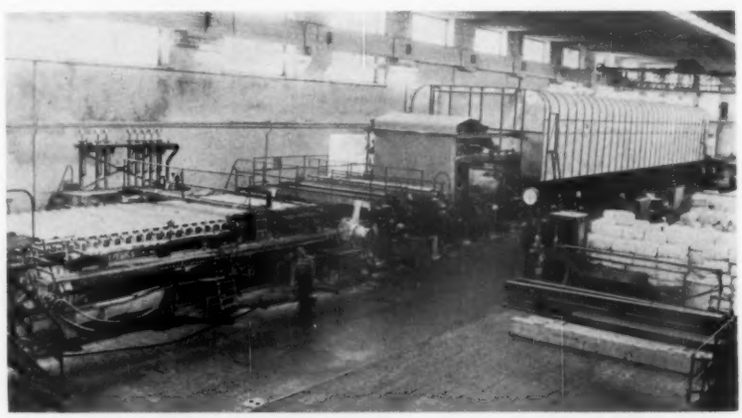
By Dipl. Ing. G. H. SAAF-NORDEN
Association of Austrian Pulp, Paper and Paperboard Manufacturers

—Vienna

Dame Fortune proved a two-faced mistress for Austria's paper industry in 1959—smiling on it with one face, frowning with the other.

A slight downward trend in production indicated in 1958 was successfully reversed and pulp, paper and paperboard production was on the increase during the past year. On the other hand, proceeds in almost all grades were down during 1959.

On the one side, domestic production and sales showed a quantitative



DOUBLED PRODUCTION CAPACITY at Austria's Arland mill resulted from installation of this new 3.20 m (126 in.) Sandy Hill paper machine.

boom, thanks mainly to the per capita consumption increase. But the export picture was not nearly so bright and showed a downward trend during most of the year, reversing only near its end.

Indicative of this paradoxical situation are the facts: Paper production was up 4% to 490,910 short tons compared with 1958's 472,098 tons, yet in spite of a shift in paper production from cheap to high quality grades, average proceeds fell .8%. Production of chemical pulp was 483,844 short tons, a 2.5% increase over 1958's 472,304 tons, but regardless of a shift to bleached sulfite for dissolving pulp, average proceeds dropped 4.5%. Mechanical pulp reached 170,469 tons, a 1% increase over the 170,192 tons of 1958, but proceeds were off 3.5%.

Furthermore, exports in 1959 showed in almost all areas, quantitative increases with simultaneous decreases in proceeds. Paper exports reached 276,955 tons, a 3% increase over 1958, but proceeds dropped almost 4%. Chemical pulp exports in 1959 were 196,979 short tons, almost 4% better than '58, yet proceeds were off 4.7%. And so it went.

Eastern bloc countries also contributed to some of the problems. Paper sales in 1959 increased 6.5% to 13,228 tons, but the sales structure shifted. As a consequence of newsprint imports from the Eastern bloc countries, sales dropped by about 5,512 short tons. At the same time, sales of other printing and writing papers increased 6,614 short tons as well as sales in wrapping papers (9,370 tons) and various other grades (2,756 tons).

Another contributing factor was an increase in imports of chemical pulp and paper. An increase of almost 37% of bone dry chemical pulp was imported into the country in 1959—a total of 27,336 tons. Most of this was bleached and unbleached sulfite pulp.

DIPL.-ING. G. H. SAAF-NORDEN is department chief, Technical Division, Austrian Pulp and Paper Manufacturers Association, Vienna and also acts as private consultant to industries. He is editor in Austria.

TOP MEN IN ASSOCIATION OF AUSTRIAN Pulp, Paper and Paperboard Manufacturers are Pres. Dr. Heinrich Salzer (left), owner of Mathaeus Salzer's Sohne Pulp and Paper Mills and vice pres. Hans Poppovic (right), pres. and gen. dir. of both the Bunzl & Biach Paper Mills and Lenzing Pulp and Paper Mills.

AUSTRIA—PAPER AND BOARD PRODUCTION
(in short tons)

Year	*Newsprint*	*Book Paper*	*Wrapping Paper*	*Fine & Special*	*Paperboard*
1937	69,718	117,326	57,475	10,791	70,510
1950	78,316	101,661	66,162	16,602	64,939
1951	83,964	110,081	73,096	20,341	74,568
1952	82,037	109,628	62,946	22,266	70,084
1953	92,249	133,901	71,866	28,323	68,804
1954	116,166	151,754	100,905	32,883	85,196
1955	136,833	159,988	102,179	37,085	93,624
1956	176,515	158,000	102,000	27,000	93,038
1957	145,816	170,096	115,414	44,061	101,688
1958	154,076	158,742	115,759	43,511	100,587
1959	151,270	167,486	126,382	46,874	98,810

AUSTRIA—PULP PRODUCTION
(in short tons) bone dry

Year	*Sulfite*	*Dissolving*	*Sulfate*	*Mechanical*
1937	255,453	13,893	24,948	106,436
1950	209,129	42,096	23,816	102,672
1951	215,557	58,711	25,694	116,276
1952	209,509	48,947	25,066	108,043
1953	237,213	49,828	37,340	126,378
1954	267,366	59,534	81,829	152,243
1955	283,473	65,870	95,055	163,279
1956	282,000	66,000	97,000	186,131
1957	292,779	75,736	103,995	174,677
1958	294,375	77,691	100,227	168,843
1959	296,089	84,739	102,954	170,446

AUSTRIA—PAPER AND BOARD EXPORT
(in short tons)

Year	*Newsprint*	*Book Paper*	*Wrapping Paper*	*Fine Paper*	*Paperboard*
1937	61,972	31,867	29,148	5,955	35,970
1950	48,522	51,715	15,301	8,599	13,889
1951	51,533	54,704	18,484	9,530	18,777
1952	54,124	50,093	11,023	13,624	13,845
1953	60,981	81,690	20,304	19,546	22,752
1954	83,088	90,581	36,594	20,931	29,373
1955	101,879	97,761	32,916	23,671	28,523
1956	140,593	88,000	30,000	16,000	30,185
1957	106,417	99,063	38,988	27,902	27,409
1958	98,857	107,797	37,100	19,843	34,326
1959	71,197	137,362	36,723	30,885	27,133

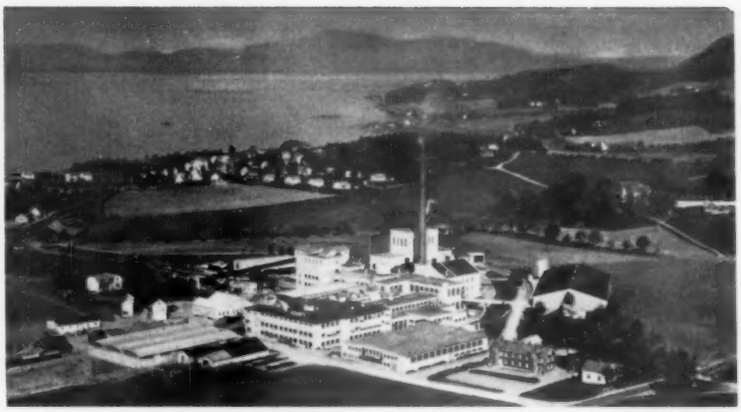
AUSTRIA—PULP EXPORT
(in short tons) bone dry

Year	*Sulfite*	*Dissolving*	*Sulfate*	*Mechanical*
1937	136,423	12,737	10,340	20,669
1950	87,052	11,905	8,963	6,391
1951	70,253	18,016	9,457	6,106
1952	71,329	11,450	7,920	5,255
1953	84,161	19,451	13,278	9,483
1954	87,657	24,490	34,259	4,937
1955	92,667	25,119	46,576	8,210
1956	98,000	33,000	46,600	8,192
1957	97,077	34,388	43,229	12,264
1958	121,079	35,858	53,954	8,258
1959	126,281	40,582	50,510	12,220

Paper imports overall, increased an amazing 75%.

Expansion continued in the industry. In addition to a number of important auxiliary plants, five new paper machines were purchased during the year. Three of these are already in operation and the other two are under construction. Consumption of electric power increased by 4.3% to 851.2 million kwh and more than 65% of this was produced in firm-owned plants.

The industry was also affected by the new 45-hour week, a reduction from the 48-hour duty of the past. There were indirect increases in vacation and Christmas bonuses. Significant was inauguration of the new Apprentice Home of the Austrian pulp and paper industry, underlining the endeavors of the industry to give to their apprentices the best possible training and education.



ONE OF NORWAY'S BIGGEST KRAFT PAPER MILLS, A/S Ranheim Papirfabrik, celebrated its 75th anniversary during 1959. Plant produces its own pulp.

Norway

Industry exceeds national average in output increase

Population: 3,560,000. Per capita paper and paperboard consumption: 166 lbs.
Paper and paperboard mills: 69; woodpulp mills: 62

Production	1958	1959
	(short tons)	
Paper and paperboard	708,459	787,368
Chemical woodpulp	702,999	747,670
Mechanical or groundwood pulp	711,636	775,588
Paper and paperboard imports	9,583	11,502
Paper and paperboard exports	423,314	501,583
Woodpulp imports	23,394	39,953
Woodpulp exports	744,192	799,989

Principal grades made: All kinds
Principal paper and paperboard imports from: Sweden, Finland, West Germany
Principal paper and paperboard exports to: United Kingdom, West Germany, the Netherlands, Denmark
Principal woodpulp imports from: Sweden
Principal woodpulp exports to: United Kingdom, France, U.S.A., the Netherlands, West Germany

—Oslo

Preliminary economic data show that 1959 was a year of pronounced production increases in overall Norwegian industry. According to provisional volume estimates, gross national product was nearly 4.5% and net national product almost 3.5% over 1958 figures.

This growth rate was not only considerably higher than that of 1958, but also well above the average for the 1953-57 period of expansion.

In forestry, according to unofficial data, total output during the 1958-59 felling season was 7,000,000 cu. meters conifer timber for sale. This was 700,000 less than in the 1957-58 season.

As in most other western European countries, Norway's economic revival began during the late autumn of 1958. In the beginning this revival was rather modest but became more pronounced during the spring of 1959 and continued to gather momentum during the remainder of the year.

Demand Expansion Seen

Foreign demand for Norwegian exports improved late in 1958, and this improvement was especially marked from the second quarter of 1959 to the end of the year. Major increases were in base metals, paper, pulp chemicals, canned fish and dairy products.

And demand conditions seem set for further expansion. There is every indication that the international upswing will continue, and that demand for Norwegian exports (including pulp and paper) will increase.

Trygve Lie, former Secretary General of the United Nations and prominent in Norwegian internal and foreign affairs, visited the U.S. during

NORWAY—Pulp Produced
(in thousands of short tons)

	Mech.	Sulfite	Sulfate	Total Chem.
1937	599	527	82	609
1946	308	207	46	253
1950	590	449	84	533
1951	613	491	93	584
1952	569	454	92	546
1953	585	504	92	600
1954	708	556	95	651
1955	713	575	106	681
1956	726	547	109	656
1957	737	586	129	715
1958	712	566	137	703
1959	775	590	158	748

NORWAY—Paper Produced*
(in thousands of short tons)

	Paper	Board	Total
1937	457	44	501
1950	474	56	530
1951	504	60	564
1952	463	52	515
1953	495	62	557
1954	551	76	627
1955	576	80	656
1956	578	74	652
1957	635	77	712
1958	633	76	709
1959	710	77	787

*Not including wallboard.

NORWAY—Pulp Exports
(in thousands of short tons)

	Mech.	Sulfite Bleached	Sulfite Unbl.	Sulfate	Total Chem.
1937	354	298	56	30	384
1946	91	86	2	6	94
1950	344	236	6	16	258
1951	369	228	10	15	253
1952	352	212	8	16	236
1953	339	301	13	18	332
1954	423	285	12	21	318
1955	443	282	10	23	315
1956	474	271	8	17	296
1957	460	274	9	23	306
1958	415	297	8	24	329
1959	449	297	8	26	331

NORWAY—Paper Exports*
(in thousands of short tons)

	Wrapping	News	Other	Board	Total
1937	100	195	62	25	382
1949	63	165	80	17	325
1950	80	158	93	30	361
1951	82	152	101	31	366
1952	52	146	62	27	287
1953	72	146	94	26	338
1954	91	149	107	44	391
1955	89	145	132	44	375
1956	89	169	101	41	400
1957	107	164	123	45	439
1958	108	164	111	41	424
1959	132	196	132	41	501

*Not including wallboard.

1959 in an effort to obtain a loan for a proposed kraft pulp (and perhaps paper) mill to be constructed at the ice-free Arctic Ocean port of Kirkenes. This is a Norwegian-Finnish project.

Mr. Lie reported that possibilities for obtaining the loan "seem promising." A 60,000-ton plant is projected, and capital needs are estimated at $26,000,000.

Good Year for Pulp, Paper

The pulp and paper industry stood way above the national average for production increase. Paper and paperboard output was 11% above the previous year, while pulp was up nearly 8%.

Paper and paperboard exports were up more than 18% to 501,583 short tons, and woodpulp exports showed a jump of just under 5%.

Expansions Keep Pace

A new kraft paper machine was ordered by Hurum Fabriker Lövenskiold-Voekero. The unit will have annual production capacity of between 6,600 and 8,800 short tons high-quality papers. Total cost of the project. $980,000.

And Saugbrugsforeningen at Halden established a new company production record of 75,246 short tons, eclipsing the old mark of 73,274 set in 1958. Big 1959 project was bleach plant rebuild.

Another record in Norway: Hunsfors Fabrikker produced 14.5% more paper last year than in 1958.

TOP MEN AT PAPIERFABRIK PERLIN (left to right): Werner Maeder, managing director; Jacob Hohl, plant engineer; Edwin Odermatt, assistant mill manager; Dr. Walter Vogel, paper mill superintendent.

Switzerland

Pulp imports set new record, two more new paper machines

Population: 5,300,000. Per capita paper consumption: 176 lbs.
Paper and paperboard mills: 36; woodpulp mills: 3; straw or vegetable fiber mills: none

Production	1958	1959
	(short tons)	
Paper and paperboard	426,000	468,474
Chemical woodpulp	100,000	97,257
Mechanical or groundwood pulp	116,000	120,750
Paper and board imports	19,500	20,000
Paper and board exports	10,000	14,032
Woodpulp imports	55,000	59,465
Woodpulp exports	10,000	9,313

Principal paper grades made: All kinds, newsprint, kraft, paperboard
Principal paper imports from: Germany, Sweden, Austria, Finland
Principal paper exports to: France, Germany
Principal pulp imports from: Sweden, Austria, Finland, Canada
Principal pulp exports to: France, Italy

—Zurich

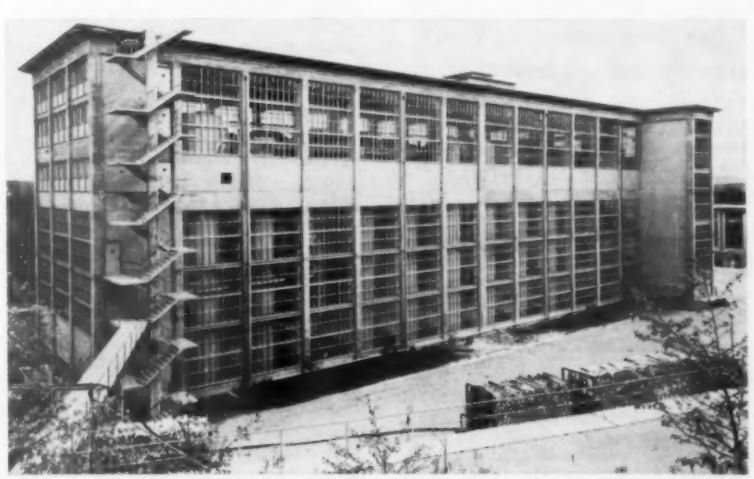
Outlook for pulp seems very good in this relatively small market. Imports have increased steadily since the war and are now between 80,000 and 90,000 tons a year. In 1959, the highest import figures were recorded to date—90,800 tons. And increases are expected to continue during the next few years.

Consumption of paper is also on the increase. Swiss paper mills have improved and adapted their equipment to meet increasing demands. New machines, in some cases replacing older ones, continue to appear every year.

One problem which threatens to retard continued growth is a labor shortage. But all mills continue their best to improve and increase production, adding bigger and faster machines. Consumption of pulp, therefore, is bound to increase.

One interesting aspect is the increasing import of pulps from France, Germany, Italy and especially Austria. Sweden, however, continues to be the most important supplier. Imports from U.S.A. and Canada meanwhile have been on the wane during the past years. Imports will increase even more under the European Free Trade Association which is responsible for an import reduction of 20%. But this is causing certain uneasiness among paper producers who fear it may prove unfavorable to the industry's rapid growth picture.

Of major interest, not only to the Swiss paper market but the entire European picture, was acquisition by Bowaters of Britain of a 51% interest in the erratic "Papierholding St. Moritz AB." Its stock has thus risen from a very low figure. This company holds shares in several big French paper companies, in a Canadian pulp and wood sales company and in a small firm in England.



NEW ADDITION TO ATTISHOLZ MILL in Switzerland is this eight-stage continuous bleach plant which boosted annual capacity from 13,000 short tons to its present 49,500 short tons. Yield is also higher.

EUROPE

Observers feel that this may mean British and French investment in a major paper development within the Common Market. The alternative is that St. Moritz is considered a strong future investment. In any case it is a wonderful testimonial to the general strength of the paper industry and its future in Europe when past problems of the St. Moritz company are considered.

Adding New Paper Machines

Papierfabrik Perlin, Zurich, is one of five mills in Switzerland which have recently added, or will soon add, new paper machines. Perlin has already received its new machine by J. M. Voith GmbH, Heidenheim, W. Germany.

At Perlin, Werner Maeder is managing director. Others of his staff are Jacob Hohl, plant engineer, Edwin Odermatt, assistant mill manager, and Dr. Walter Vogel, paper mill superintendent.

In addition to Perlin, the Cham and Balsthal mills were delivered machines in the past year (the second for Balsthal in three years—both Beloits). New machines have been ordered for the Sihl-Zurich and Laufen mills. This will give Switzerland over half a million tons of paper production per year.

SWISS PRODUCTION

(In Thousands of Short Tons)

	Sulfite Pulp	*Ground wood*	*News-Print*	*Other Printing Paper*	*Wrapping Paper*	*Other*	*All Paper*	*Paper Board*	*Paper and Board Total*
1935	45	43	34	29	22	27	112	40	152
1945	62	52	40	36	35	34	145	44	189
1950	80	77	52	50	45	40	187	55	242
1951	97	87	55	55	53	57	220	66	286
1952	85	88	55	56	53	61	225	71	296
1953	77	88	60	55	44	60	219	77	296
1954	94	99	66	64	53	70	253	88	341
1955	96	105	72	70	62	77	281	99	380
1956	99	110	77	77	72	77	303	104	407
1957	103	110	74	83	80	82	319	110	429
1958	100	116	77	86	75	78	316	110	426
1959	97	121	81	93	82	91	347	121	468

Hungary

Paper needs expanding with growing cultural level

Population: 9,980,000. Per capita paper consumption: 37.4 lbs.
Paper and paperboard mills: 9; woodpulp mills: 1; straw or vegetable fiber mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	120,897	136,298
Chemical woodpulp	19,600	22,216
Mechanical or groundwood pulp	19,597	20,967
Straw or other vegetable fiber pulp	3,253	4,803
Paper and board imports	43,444	50,668
Woodpulp imports	43,729	31,509
Principal paper grades made:		
kraft	11.4%	12.7%
sulfite:	29.0%	30.5%
book and writing:	26.5%	25.5%
paperboard:	26.0%	24.5%
cigaret and fine papers:	0.8%	0.7%

Principal paper imports from: USSR, Czecho-Slovakia, Scandinavia, Austria
Principal pulp imports from: USSR, Czecho-Slovakia, Scandinavia, Austria

By GEORGE VAMOS
Editor for Hungary

—Budapest

Major 1959 event in the Hungarian pulp and paper industry was the start-up of new No. 4 paper machine at Papierfabrik Csepel. Designed by the Austrian works of J. M. Voith GmbH, the unit boasts a continuous and completely automated stock preparation system. It is equipped to process separately the three principal pulps used in kraft output; sulfate, straw and sulfate waste paper, and has daily production capacity of 100 tons of kraft paper for multiwall bags.

Most other mills completed improvement and expansion projects that increased total national production. Especially important to the overall output picture was expansion undertaken at the straw pulp mill in Szolnok, which doubled its production over 1958. The mill is consuming considerable amounts of rice straw native to the region. Additionally, a corrugated board plant entered production during the year. This makes it possible to meet most of the country's needs in this field.

Growing Cultural Level

Demand for paper and paperboard in Hungary is constantly on the increase, reflecting an upward trend in the cultural level. Home production as yet is unable to meet demand in all qualities, and therefore imports are growing to keep pace with need.

Large effort is being made on the part of the local industry to insure availability of its raw material sources. This is made difficult in that Hungary does not boast extensive coniferous forests. The solution will be found principally in the utilization of straw and hardwoods (poplar, willow, beech, oak, etc.).

Construction was begun last year at the new straw pulp mill in Sztálinváros. The plant incorporates a Pandia system and will eventually be equipped with paper machines. This being but one of the projects aimed at satisfying the predicted high demand for paper and paperboard.

DR. GEORGE VAMOS, editor in Hungary, is director of the Hungarian Paper Industry Research Institute in Budapest.

Straw Pulping Dominates Meeting

Delegates from 14 countries in both western and eastern Europe attended last fall's International Conference of Pulp & Paper Manufacturing and Graphic Arts. The meeting was held in Budapest. Much emphasis was placed on straw pulping, in which there is a strong expansion trend in such nations as Hungary, U.S.S.R., Yugoslavia, France, etc.

Represented at the conference were Austria, the United Kingdom, Bulgaria, Czechoslovakia, East Germany, West Germany. Finland, France, Italy, Poland, Rumania, Sweden, U.S.S.R. and Yugoslavia. Chairman was L. Földi, vice minister in the Hungarian Ministry of Light Industry and president of the Hungarian Technical Assn. of the Paper & Printing Industries.

Some 600 delegates attended the convention, more than 100 from western Europe. East and West came together "in friendly atmosphere" to discuss the scientific and technical

problems of modern pulp and paper manufacture.

Said C. W. Converse, managing director of Black-Clawson International Ltd.: Provision for storage is of vital importance in successful design of a straw pulp mill. This because straw covers a wide field of materials "of most diverse properties," and good cleaning and storage methods are indispensable.

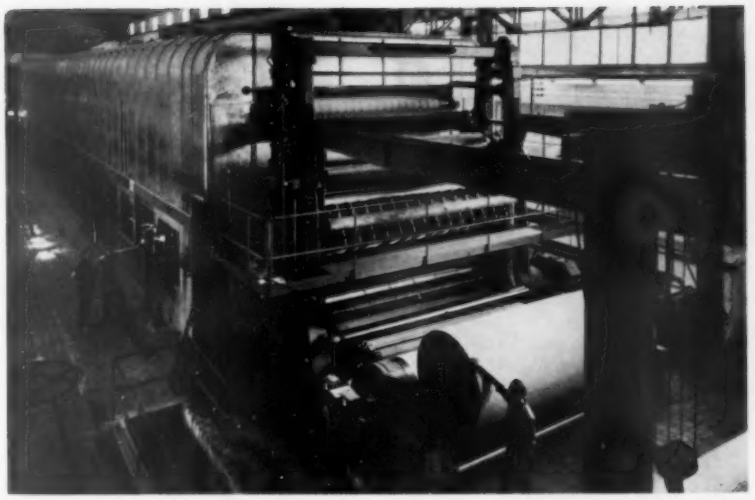
Applicable digestion technology, he said, can be determined only after consideration of mill size, straw quality, pulp strength and brightness, available chemicals, water pollution problems and type of cooking equipment available.

From Rumania came a discussion of theoretical and practical aspects of paper sizing by C. Simionescu and E. Poppel of the Technical Univ. at Jassy. It has been shown, they said, that penetration of liquid into paper takes place in two stages: (1) penetration into capillaries and (2) penetration into intermicellar areas. Only the duration of the first phenomenon has importance in measurement of sizing.

At the straw-cellulose plant being built at Sztálinváros by Komplex it is expected that the initial cost of $2,804,000 will be returned within a year. Equipment is being supplied by Lyddon & Co. Ltd. By 1963 the plant will be processing some 74,000 short tons baled straw to produce 25,000 tons bleached cellulose for paper.

Meanwhile, proposals have been made to nearly double paper production and increase cellulose production by 300% in the next five-year plan (1961-65). This would raise paper production to some 228,250 tons by 1965. Included will be construction of a new mill at Labatlan in northwest Hungary and expansion and modernization of several other Hungarian mills.

WILLIAM F. BOKS, who has served as editor in Belgium for a number of years, is the administrator of Compagnie Commerciale Gross & Irgens, S.A., prominent firm in the pulp and paper marketing field.



KRAFT PAPER FOR MULTIWALL BAGS is turned out by this Voith machine at Csepel, near Budapest, Hungary, at speeds up to 1150 ft. per min.

Belgium

Mills prepare greater output for Common Market opportunities

Population: 9,124,000. Per capita paper consumption: 132.3 lbs.
Paper and paperboard mills: 32; woodpulp mills: 4; straw or vegetable fiber pulp mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	396,000	410,000
Chemical woodpulp	45,514	55,000
Mechanical, groundwood, straw (or other vegetable fiber) pulp	88,161	89,000
Paper and board imports	227,900	256,700
Paper and board exports	109,400	114,600
Woodpulp imports	200,000	203,000
Woodpulp exports	14,500	6,000

Principal paper grades made: Newsprint, kraft, book and writing, wrapping
Principal paper imports from: Netherlands, Finland, Sweden
Principal paper exports to: Netherlands, W. Germany, France
Principal pulp imports from: Sweden, Finland, Norway
Principal pulp exports to: France

—Brussels

● After the slight recession of the closing months of 1958, the first months of 1959 brought some improvement in the general economic situation of our country, which improvement was also felt in the paper industry the second halfyear of 1959.

The total production of paper and paper-board for 1959 amounted to some 372,000 metric tons, which means an improvement of about 12,000 tons or 3% over the figure for 1958.

During 1959 most Belgian paper mills continued and even stepped up their extensive program of modernization and expansion in view of the Common Market. This Market's opportunities for trade are viewed with confidence by the Belgian paper industry, but in order to bring our mills in a competitive position with the powerful paper concerns existing in neighboring countries, very heavy investments will remain necessary over a series of years.

During the transition period before the Common Market comes into full operation, the Belgian mills will endeavor to strengthen their position in the other member countries. This farsighted policy involves at present heavy sacrifices in price, owing to the still existing duties and considering the fact that in Belgium wages are highest of all Common Market countries, for instance about 35% higher than in Holland.

Imports and Exports

Imports of foreign papers into Belgium showed an all time record in 1959 with about 225,000 tons, which is nearly three times as much as our exports, amounting to about 83,000 tons. The main supplying countries are

Belgium-Paper Imports	*Metric Tons (approx.)*
Holland	69,000
Finland	54,000
Sweden	44,000
Norway	19,800
France	10,700

Russia and other Eastern European Communist countries sold about 8000 tons of paper on our market, mainly

at reduced prices.

On the other hand Belgium's principal customers were:

Belgium-Paper Exports	*Tons (approx.)*
Holland	41,400
West Germany	19,900
Argentine	7,000
France	3,400

Duty on Pulp Imports

A matter of concern to the Belgian paper industry for some time has been the problem of the eventual levy of an import duty on woodpulp coming from countries outside the Common Market, which are our traditional suppliers. Some Common Market countries, having a comparatively important pulp industry of their own, are in favor of a heavy duty on pulp imported from non-member countries, and France insisted on a common duty of 10%. A compromise of 6% duty was finally reached, with each member having the right to allow the import free of duty of a practically unlimited contingent of pulp. This means that in practice Belgium can, as hitherto, continue to import pulp free of duty from countries outside the Common Market, and this arrangement was of course welcomed with considerable relief.

Production continues to be high in 1960 and practically all mills are fully booked with orders for several months ahead.

Belgian Paper Production—1959 By Grades:

Grade	*Metric Tons*
Writing and printing paper	101,214
Parchment, greaseproof, imitations	19,366
Kraft paper	31,439
Wrapping papers	57,040
Newsprint	81,832
Other papers	40,702
Cardboard	40,737
	372,330

HENK VOORN, editor of his country's paper industry magazine, "De Papierwereld," is editor in The Netherlands.

BELGIUM—PAPER PRODUCTION
(in thousands of short tons)

	News	*Book and Fine*	*Wrapping and Coarse*	*Total Paper*	*Paper Board*	*Total Paper and Paperboard*
1939	52	85	85	235	26	261
1948	48	98	87	245	26	271
1950	68	105	113	304	23	327
1952	58	75	90	246	36	282
1953	61	79	117	270	37	308
1954	57	84	134	291	45	335
1955	62	88	193	306	46	352
1956	63	91	118	315	56	371
1957	94	99	121	365	57	422
1958	98	100	157	355	41	396
1959	90	103	172	365	45	410

BELGIUM—PULP
(in thousands of short tons)

	Production		*Consumption*	
	Chem.	*Mech.*	*Chem.*	*Mech.*
1939.....	28	36	155	65
1949.....	20	42	116	75
1952.....	34	55	100	68
1954.....	45	58	143	71
1955.....	45	62	202	75
1956.....	47	62	206	76
1957.....	48	86	238	101
1958.....	45	88	218	106
1959.....	55	89	242	99

BELGIUM—PAPER CONSUMED
(short tons)

	Newsprint	*Total Paper & Paperboard*
1936.....	89,300	296,000
1949.....	77.100	346,800
1951.....	87,700	407,400
1953.....	90,820	405,994
1955.....	101,142	482,626
1956.....	101,522	483,592
1957.....	124,422	557,676
1958.....	116,297	515,152
1959.....	113,627	551,640

Netherlands

Production at record pace, 1960 promises 600,000 tons

Population: 11,173,000. Per capita paper and paperboard consumption: 137 lbs.
Paper and paperboard (and/or strawpaper and strawboard) mills: 41

Production	1958 (short tons)	1959
Paper and paperboard (excluding strawpaper and strawboard)	581,587	651,347
Chemical woodpulp	45,000*	55,000*
Mechanical pulp	100,000*	100,000*
Strawboard	396,000	396,000
Paper and paperboard imports	242,827	277,415
Paper and paperboard exports	135,267	152,841
Chemical woodpulp imports	(n. a.)	227,000

(n.a.) Not available
*Estimated.

Principal grades made: Newsprint, printing and writing paper (wood-containing and wood-free), packaging and wrapping, paperboard, straw paper and board, miscellaneous
Principal paper and board exports to: Belgium, Luxembourg, West Germany, United Kingdom
Principal paper and paperboard imports from: Sweden, Belgium, Luxembourg, Finland
Principal woodpulp imports from: Sweden, Finland, Norway

By HENK VOORN
Editor, De Papierwereld

—Haarlem

Paper and board production is rocketing upward at a record-smashing pace. Monthly output is now approaching the 50,000-metric ton mark. In 1959 production increased 12% to 592,134 metric tons.

Newsprint was up from 126,314 metric tons to 130,890; wood-containing papers from 57,178 to 64,218; wood-free papers from 89,571 to 103,064; wrapping and board from 219,250 to 258,784, while the "other paper" category showed a drop from 36,402 to 35,178.

"Other papers" include sanitary tissues, toilet paper, cellulose wadding, etc., and have comprised the least prosperous group. Use of some of these grades is not so widespread as in the U.S.—a price problem that will be solved only by installation of large production units. As the home market is too small to support such facilities, export outlets are absolutely necessary, and international competition is already extremely keen.

Newsprint Expansion Doubtful

Newsprint output was up only 4% over 1958, and future important production increases are not expected. This is because under the Common Market domestic mills will probably not be able to compete against the Scandinavian countries.

Writing and printing papers containing mechanical woodpulp showed a jump of 12%, and wood-free papers and wrappings were up 14% and 18%, respectively. Wrapping papers have accounted for much of the overall production increase in the industry.

New distribution methods such as

self-service stores are rapidly becoming popular, resulting in vastly increased need for packaging materials. Also—thanks in large measure to studies undertaken at the semi-official Research Institute for Packaging—use of paper for purposes formerly exclusive to textiles, wood or metal is on a steady increase.

The sharp increases in writing and printing papers (principally woodfree) is based to a great degree on the ever-growing export market of the Dutch printing industry. Export value of printing paper in 1959 was not less than 116,000,000 guilders ($30,763,200), an increase of 15.8% over the previous year. For the first time, the 1952 record (108,000,000 guilders) was bettered.

The statistics are more impressive when it is considered that in 1952 exports of printed paper to the former Netherlands Indies (now Indonesia) were valued at 47,000,000 guilders. The figure has now shrunk to 1,280,000.

Strawboard production, for which exact figures are available only at the end of the harvest season, is about 360,000 metric tons annually. This is not included in paper and board output figures and should be kept in mind when compiling per capita consumption data.

Staff Training Problems

Apart from university work and advanced technical education, the 1959 training available to lower echelon staff members at paper mills was rather meager. The mill of Van Gelder Zonen at Velsen boasted a papermakers school open to boys with an elementary school education. In the south—at Boxmeer—a lower technical school gives one year of papermaking instruction after two years of elementary technical courses.

The papermakers at Veluwe (Gelderland) are operating for the second year a specialized elementary technical school only for papermakers. This is open to boys who have completed an elementary education. The three-year course gives fundamental training in physics and chemistry, papermaking and converting. The school has proved a great success and is now completely subsidized by the government. The new building at Loenen—a $100,000 project—was to be ready this summer.

Confidence for the Future

The future of the Dutch paper industry is linked closely with development of the Common Market. Free importation of raw material is of the utmost importance. Though the importance of domestic straw and waste-paper is great, generally speaking the raw material position of the industry is a weak one. Even if Dutch wishes in this respect are met by other nations, some changes in the paper industry—tending to eliminate mass production and to concentrate on fine grades and specialties—are to be expected.

The Netherlands paper industry has the most modern equipment available, and scientific research—both in the mills and at research institutes—is intense.

These factors, combined with the favorable business climate, give confidence for the future. A new production record of 600,000 metric tons may well be possible this year.

Spain

Pulp production maintains level but paper and board is up 12%

Population: 29,894,026. Per capita paper and paperboard consumption: 25.6 lbs.
Paper and paperboard mills: 255; Woodpulp mills: 28; Straw or vegetable fiber pulp mills: 70

Production (short tons)	1958	1959
Paper and paperboard	335,000	374,000
Chemical woodpulp	45,800	50,000
Mechanical pulp	72,000	73,000
Straw or other vegetable fiber pulp	30,000	49,000
Total pulp	147,800	172,000
Paper and paperboard imports	20,000	13,120
Woodpulp imports	120,000	117,000
Paper and paperboard exports	120	285

Principal grades made: Book and writing, kraft papers, newsprint, paperboard and sulfite papers.
Principal paper exports to: Cuba, Phillippines
Principal woodpulp imports from: Russia, Sweden, Norway
Principal paper and paperboard imports from: Sweden, Finland, Norway

By JOSÉ LUIS ASENJO MARTÍNEZ
Editor for Spain

—Madrid

Spanish national pulp production has been maintained at the same level for two years. During 1959 pulp production totaled approximately 255,000 metric tons, divided as follows: 32,400 tons, straw pulp; 3,700, rags; 66,000, groundwood; 45,000 chemical woodpulp unbleached and bleached; 75,000 waste paper pulp and 12,600 of various other grades.

There were increases over 1958 in woodpulps, amounting to 7,000 tons, and in waste paper pulp of 3,000 tons. Pulps of vegetable fiber origin decreased in a total of 10,000 metric tons, this including straw and matweed pulps.

JOSÉ LUIS ASENJO MARTÍNEZ is editor in Spain and has supplied the review material for this issue. He is assistant manager of "La Papelera Espanola, S.A.," the largest paper company in Spain and is a student of economic trends in the pulp and paper industry of his country.

National pulp production weakened in the last months of 1959, due to the crisis suffered by consumer industries. Imports of foreign pulps destined for paper have maintained a lower level—approximately—10% below that of the previous three years; nevertheless prospects for new developments are optimistic.

Pulp From Russia

Under a trade agreement with Russia a considerable amount of pulp comes from that country, but Scandinavia is the traditional supplier for Spain.

Concerning the paper market, a certain weakness in demand has been observed, but without preventing a greater production in 1959 than in previous years, and also a greater in-

LOCATIONS OF THREE MILLS which Spanish government plans . . . The mill at Pontevedra would make kraft pulp from pine; the mill at Huelva would make rayon pulp from eucalyptus and the mill at Motril would make sugar cane bagasse kraft pulp.

EUROPE

SPAIN—PAPER PRODUCTION

(In Short Tons)

	Fine	*Tissue*	*Newsprint*	*Kraft*	*Paperboard*	*Printing Paper*	*Total (inc. other grades)*
1949	10,397	1,653	19,536	4,762	23,686	96,631	156,665
1950	12,429	2,205	22,020	5,179	29,038	117,317	189,292
1951	13,115	2,415	25,270	6,100	32,500	122,350	201,750
1952	13,410	2,750	25,550	10,536	36,448	123,957	212,648
1953	15,378	1,663	23,166	11,743	55,352	85,064	200,323
1954	15,080	3,540	34,475	19,430	34,742	147,107	254,374
1955	14,520	5,720	36,562	24,220	40,832	102,300	256,740
1956	15,730	3,300	40,150	31,680	44,000	120,000	286,880
1957	19,615	4,000	44,611	36,128	49,170	121,624	310,200
1958	20,600	4,200	46,700	39,000	57,600	117,600	335,000
1959	19,000	4,300	58,500	44,000	57,000	152,000	375,000

crease in percentages, amounting to a 12% rise. Total production of all paper and board grades increased from 304,500 to 340,700 metric tons. Main increases were registered in printing and writing papers, which rose from 107,000 to 138,000 metric tons, as well as for newsprint, which increased from 42,500 metric tons to 54,000 tons. Paperboard and packaging papers appear somewhat stabilized and fine paper as well as cartons decreased slightly.

If we add to this production the tonnage of special paper imports (photographic papers, duplex, condenser paper, electrotechnical, impregnating paper, lithographic, decalcomania, drawing and tracing grades, paperboard for statistical machines, metallized paper and felt boards) and newsprint imports, we will find that per capita consumption of paper in Spain has raised to 11.7 kilos.

New Mills

During 1959 plans and projects of several firms have advanced considerably. We may mention the new machine installed by "La Montañanesa S.A." which will produce approximately 25,000 metric tons.

The national government is building cellulose and paper plants in Pontevedra, Huelva and Granada. Planning for all three mills is not yet finalized, but construction has begun on the "Empresa Nacional de Celulosas de Motril" in Granada. This mill expects to produce 37,000 tons a year of sugar cane bagasse kraft pulp and to make 3000 tons of corrugated, 7500 tons of packaging and 7000 tons of printing papers.

Increase in Production

The increase in Spanish paper production is mainly due to a better ultilization of existing machines and to improvements obtained by Spanish producers in pulp preparation and dry stage operations, in an effort to modernize their mechanical units.

In 1959 "La Papelera Española S.A." finished in its Aranguren plant the new kraft pulp bleaching installation, following the "Progil" system lines. This installation permits the bleaching of 15 tons daily in a first stage operation and of 30 tons in a second phase. "La Papelera Española" is Spain's largest paper company, making about one third of all paper production in several mills from Bilbao to Barcelona and Valencia.

The government's National Institute of Industry in Madrid is responsible for plans for the three new government mills. The one in Pontevedra in the northeast would be based upon woodpulp from pine, using the kraft process. The mill planned for Huelva province would make rayon pulp from eucalyptus.

The rayon pulp production in Spain rose to close to 40,000 metric trons last year with the new SNIACE's eucalyptus-rayon pulp mill.

Greece

German companies planning to build mills, may use straw

Population: 8,500,000; per capita paper consumption: 18 lbs.
Paper mills: 6; paperboard mills: 10; (1 strawboard mill not working)

Production (short tons)	**1958**	**1959**
Paper and paperboard	**60,000**	**75,000**
Pulp	**8,000**	**None**
Paper and paperboard imports	**25,000**	**25,000**
Paper and paper box exports	**1,300**	**1,300**
Woodpulp imports	**42,000**	**60,000**

Principal paper and paperboard exports to: Egypt
Principal paper, paperboard and pulp imports from: Sweden, Austria, Finland, Germany, United States, Italy, Norway, Canada

—Athens

Prof.-Dr.-Ing. Georg Jayme, director of the Institute for Cellulose Chemistry at Darmstadt Technical Institute, Darmstadt, Germany, has been appointed by the Greek government to advise Greece in development of its pulp and paper industry. Dr. Jayme recently made a trip to Greece with three technical associates.

Several German companies are planning to combine in building mills in Greece. Dr. Jayme declares that Greece should use more of its straw, and also undertake reforestation. A straw mill here producing 8,000 tons a year, ceased operation last year.

Industry Growing

In comparison with other industries, the paper industry of Greece is a relatively new branch, which is progressing rapidly.

This progress was halted by the destructive war of 1940-1941, followed by the occupation of Greece which, for a period of 3½ years, greatly injured the country. The equipment of the industrial plants was destroyed due to improper use and lack of maintenance, while a part of it was transported beyond the Greek borders by the troops of occupation.

After the war, the Greek state tried to help industrialists in this field to reorganize their industries by granting loans to them. Private initiative, with the help of the state, has indeed, achieved surprising results. Thus, a new period for the Greek paper industry started, a period which might be subdivided into three phases.

First phase: Up to 1950, activity remained on a level below the pre-war one.

Second phase: From 1950 and up to the present, activity was on a level permanently higher that the prewar one.

Third phase: A reduction of the production increase-rate is noted, almost due to international competition which started with the "free import" policy. In this competition, the Greek paper industry is at a disadvantage because of high costs. Under this pressure, the industry is making a marked effort to renew its industrial equipment and to apply modern production methods, having as its immediate objective the decrease of production cost.

Numerically, the production pattern is as follows:

1939 = 100	1950 = 118
1948 = 67	1955 = 171
1949 = 93	1958 = 273

Through continuous improvements and additions, the Greek paper industry covers, at the present time, the major part of Greek requirements in paper, carboard, containers etc. It produces paper of all qualities, from the finest to the most common, while

imports from abroad are restricted to but a few luxury qualities and newsprint.

Main Greek Paper Industries	Daily Capacity Tons
E. G. Ladopoulos Papeterie	70
Athens Paper Mills	65
Greek Paper Company	30
Papyrus Mills	15

There are a few other minor ones. E. G. Ladapoulos recently installed a new Escher Wyss paper machine.

The Greek paper industry utilizes pulp as raw material, which is imported from abroad—mainly from the Scandinavian countries and, a small percentage, from the United States. The industry utilizes all the locally collected old paper, which is in turn processed into lower quality paper, while a small quantity of this material is also imported from abroad.

Attempts were made in the last few years to produce locally straw pulp through the use of the stems of wheat remaining after the harvest. But this project was dropped due to the high cost of straw, which makes production unprofitable. The use of Greek wood, by exploitation of forests in northern Greece, is not feasible because the qualities of trees required by the paper industry are not available and the quantity is limited.

Modernization

Concluding this brief outline, we must add that the Greek paper industry is making a concentrated effort to modernize its plants and to increase output by import and installation of modern and efficient units of paper producing equipment, as well as machinery for the production of paper containers. It is hoped that, very soon, not only will there be no cause for any import but, on the contrary, Greece will be in a position to export paper to neighboring countries.

GREECE

(in thousands of short tons)

	Paper Produced	*Woodpulp Imported*
1937	34	26
1946	13	13
1949	32	25
1950	38	29
1951	43	28
1952	36	16
1953	24	27
1954	30	33
1955	46	37
1956	50	40
1957	53	41
1958	60	42
1959	75	60

Italy

Production, exports, imports all score gains. Expansions apace

Population: 49,230,000. Per capita paper and paperboard consumption: 50.6 lbs.
Paper and paperboard mills: 596; woodpulp mills: 45; straw or vegetable fiber pulp mills: 20.

Production	1958	1959
	(short tons)	
Paper and paperboard	1,207,554	1,392,000
Chemical woodpulp	91,126	157,100
Mechanical or groundwood pulp	237,000	255,000
Straw or other vegetable fiber pulp	81,211	64,700
Total pulp	409,337	476,800
Paper and paperboard imports	93,824	106,100
Paper and paperboard exports	22,866	33,390
Woodpulp imports	381,829	551,000
Strawpulp exports	8,706	—

Principal paper grades made: Newsprint (239,200 short tons); kraft; book and writing (361,000); paperboard (187,900).
Principal paper and paperboard exports to: France, Yugoslavia, Turkey, Iran, Libya, Somaliland
Principal paper and paperboard imports from: Sweden, Finland, Austria
Principal strawpulp exports to: France, Switzerland, Israel, Spain
Principal woodpulp imports from: Sweden, Austria, Finland

By FRANCESCO PASTINA
Editor for Italy

—Rome

Index for overall industrial production was 10.7% above 1958. Pulp and paper showed an even better performance, 11.6% above the previous year.

Of the increase, 17.7% was in newsprint; 13.3% in wrapping, while lesser percentages were recorded in other grades. Paperboard production was up 4.7%. In pulp, mechanical rose 7.3%; chemical 11.1%.

Total 1959 paper and paperboard production was 1,392,000 short tons, of which 1,209,000 was paper—an increase of 15.4% over 1958 and some 163.8% over pre-war years.

Printing, Writing in Lead

Printing and writing paper grades were 24.2% of total production; newsprint 17.2%; wrapping 23.9%; strawpaper 12.1%; special grades 9.1%, and paperboard 13.5%.

Newsprint production stood at nearly 240,000 short tons.

ING. FRANCESCO PASTINA, editor for Southern Italy, is in charge of laboratories for Ente Nazionale Cellulosa e Carte, in Rome, an unusual organization sponsored by government and newspapers to assist newsprint mills in technical problems and raw materials supplies.

NEW TYPE OF CONTINUOUS DIGESTER for neutral sulfite semichemical pulp was developed by Escher Wyss of Germany, original 15-ton pilot unit sold to Cartiera F. A. Marsoni and used by this Italian mill for producing bleached and unbleached greaseproof paper from poplar.

EUROPE

Of mechanical pulp output, some 72.2% was manufactured from poplar.

Production of chemical pulp (wood and straw) was 321,900 short tons, an increase of about 16.5% over 1958. Of this total, 148,000 tons went into paper and board (up 14%), and 73,500 was used for dissolving pulp (up 26%). Of the chemical pulp for paper, 56.4% was made from wood, 43.6% from straw and vegetable fibers.

Exports, Imports Score Increase

Semichemical pulp output was 44,900 short tons, compared to 40,300 in 1958 (an 11% increase). This was manufactured from wood (64.1%) and from straw and other vegetable fibers (34.9%).

Imports of paper pulps were 27.6% higher than in 1958, reaching some 45,000 short tons; exports in the same category increased 5.8% to 992 tons.

Paper and paperboard imports were up 8.6% over the previous year at 106,100 short tons. Exports were up 33.2% to 33,390 tons.

Imports Trends

Trend of imports was to an expansion of kraft, contraction of newsprint.

Around the Italian Mills

SIACE, a leading pulp and paper manufacturer, is planning a pulp and paper operation in Sicily at a cost of $10,400,000. Annual production: 28,000 metric tons. Some 300,000 acres have been planted in eucalyptus.

Claimed to be the "most modern, high-grade semichemical pulp mill in the world," the new plant of Soc. Utile at Cremona is in full operation. Daily production is 30 metric tons NSSC pulp; raw material consists of low-cost poplar veneer waste and branches. Complete equipment was supplied by United States Machinery Co. Inc. (U.S.A.). This firm was also in charge of engineering and installation and supervised start-up. Production is sold for use in newsprint, glassine and bleached papers.

Cartiera del Timavo has put into operation at Trieste one of Italy's biggest newsprint mills. The paper machine with maximum speed of 580 meters per min. was built by Velmet Oy (Finland). Annual capacity: 50,000 metric tons.

VENEER WASTE IS RAW MATERIAL for new Uti-Le semichemical pulp mill in Italy. At right is plant furnishing some of veneer waste; beyond the waste pile are chipper room, boiler room, pulp mill and chip silo.

ITALY—PAPER PRODUCED

(In Short Tons)

	Newsprint		Kraft Paper		Other Paper & Paperboard	
	Produced	Consumed	Produced	Consumed	Produced	Consumed
1938	82,687	84,362	31,972	32,028	413,437	411,182
1950	94,705	98,233	44,100	45,203	396,900	410,792
1951	115,270	117,758	60,406	63,492	434,870	408,574
1952	123,503	129,897	58,973	63,272	467,329	458,731
1953	127,600	150,920	59,400	67,100	546,700	565,440
1954	140,580	162,800	66,000	80,630	605,604	607,316
1955	157,918	180,030	86,240	92,718	652,637	643,048
1956	183,883	190,277	99,660	120,346	759,538	734,527
1957	199,280	232,980	108,130	140,250	859,828	855,226
1958	206,870	242,952	111,800	144,810	889,830	961,040
1959	239,200	262,100	97,200	380,000	1,055,600	820,000

ITALY—Paper Imports-Exports
(in short tons)

Year	Import	Export
1948	28,519	17,042
1949	28,480	15,035
1950	31,911	15,316
1951	19,935	57,692
1952	27,403	24,156
1953	58,784	9,243
1954	56,557	17,994
1955	58,118	26,856
1956	56,900	25,800
1957	93,500	31,300
1958	97,400	25,020
1959	106,100	33,390

ITALY—WOODPULP PRODUCTION
(Short Tons)

	Chemical Pulp for Paper			
	Dissolving	& Board	Mechanical	Total Woodpulp
1937	0	31,010	161,766	192,776
1947	17,613	40,958	106,288	164,859
1950	48,141	60,296	140,873	249,310
1951	58,986	93,365	155,278	307,629
1952	57,332	85,979	156,726	300,037
1953	36,200	106,920	162,845	309,585
1954	64,033	112,976	163,004	340,006
1955	70,864	130,240	187,442	388,361
1956	71,708	143,813	211,000	426,521
1957	73,455	161,480	226,000	460,935
1958	58,420	172,000	237,000	467,420
1959	73,500	193,100	255,000	521,600

Czechoslovakia

Second five-year-plan calls for sweeping expansions

Population: 13,559,484. Per capita paper and paperboard consumption: 85 lbs.
Paper, paperboard and chemical woodpulp mills: 13

Production	1958	1959
	(short tons)	
Paper and paperboard	614,005	649,254
Unbleached chemical woodpulp	401,915	453,560
Bleached chemical woodpulp	109,349	114,549
Mechanical woodpulp	116,423	117,735
Total pulp	627,687	685,844
Paper and paperboard exports	72,353	72,321

Principal grades made: Newsprint, thin graphic, sulfite, sulfate, printing and writing, paperboard, wrapping, cigaret and thin
Principal paper and paperboard exports to: United Arab Republic, United Kingdom, Hungary, Italy
Principal woodpulp imports from: Finland, Sweden, U.S.S.R.

—Prague

Like most other planned economy countries, Czechoslovakia is currently undergoing a five-year-plan—its second, and one which will boost paper and pulp production considerably.

The Czechs now have 20 woodpulp and 70 paper and board mills making a variety of papers. Almost all of them have undergone some kind of expansion since the war. Technological improvements on producing machines have also added to this increase.

Under the new plan, which went into effect this year, cellulose pulp production is expected to rise to 550,000 tons. It is currently about 380,000. Paper has risen from 380,050 tons to 474,100 tons under the five-year-plan just completed. Pulp production seems to be of primary concern in the long run here, with further plans calling for an increase to 770,000 tons by 1970; 880,000 tons by 1975.

During the past year, the Cellulose Research Institute of the country, located at Bratislava, in Slovakia, was unified with the Paper Research Institute in Praha (Prague), the capital. The new institute now bears the name, Pulp and Paper Research Institute of Czechoslovakia.

Denmark

Historic highs set in output, consumption; expansion grows

Population: 4,550,000. Per capita paper consumption: 180 lbs.
Paper and paperboard mills: 12; woodpulp mills: 1; straw or vegetable fiber mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	180,000	190,000
Chemical woodpulp	—	5,000
Mechanical or groundwood pulp	6,000	6,000
Straw or other vegetable fiber pulp	11,000	12,000
Paper and board imports	200,000	240,000
Paper and board exports	14,000	15,000
Woodpulp imports	105,000	110,000
Woodpulp exports	—	6,000

Principal paper grades made: Kraft, sulfite, book & writing, paperboard, tissues, fine papers
Principal paper imports from: Sweden, Finland, Norway
Principal pulp imports from: Sweden, Finland, Norway

By ERIK PERSSON
United Paper Mills Ltd.

—Copenhagen

Production of paper and paperboard during 1959 increased by 5% to establish yet another record for the industry. Domestic mills operated at full capacity, while imports jumped 20%. Per capita consumption is increasing at an historic rate.

Dansk Lin- og Celluloseindustri at Grenaa, Jutland (producing some 8,000 tons grayboard and corrugating annually) has recently put new equipment into operation to double its capacity.

United Paper Mills Ltd., Denmark's largest producer and owner of six mills, is expanding the 40,000-ton capacity of its Ny Maglemølle mill in Naestved with installation of a Beloit Iron Works tissue machine and U. S.-built converting equipment. Target date for start-up is late 1960.

Research Pays Dividends

Following years of research and experimentation, new pulp production has been started successfully by Junckers Traekemi Ltd., Køge. Using waste beechwood from the firm's sawmill, Junckers now produces about 5,000 tons of fine semichemical pulp. Major output is being exported to the United Kingdom.

The packaging industry (converting paper and board to corrugated or solid boxes) is expanding rapidly. Dansk Kraftemballage (Kolding) doubled its capacity in 1959; while Columbusemballage, operating two plants apart from its overseas interests, is building a third factory in Fredericia. And Dansk Bølgepap-Industri—subsidiary of United Paper Mills and largest producer of corrugated boxes in Scandinavia—is extending its new plant that was completed only two years ago.

DENMARK—Production
(in short tons)

	Pulp	Paper	Paperboard
1939	570	70,000	11,000
1947	120	78,000	19,000
1950	950	91,296	23,507
1951	908	98,933	15,235
1952	2,120	96,000	18,610
1953	3,850	97,023	25,358
1954	4,070	108,300	29,700
1955 ...	11,470	120,000	35,000
1956 ...	14,800	120,000	40,000
1957 ...	15,800	120,000	50,000
1958 ...	17,000	125,000	55,000
1959 ...	23,800	130,000	60,000

Iceland

Imports in dramatic increase

Population: 174,000. Per Capita paper and paperboard consumption: 113 lbs.

	1958	1959
	(short tons)	
Paper and paperboard imports	7,125	9,805

Principal paper and paperboard imports from: Finland, United States

—Reykjavik

Producing neither pulp nor paper, Iceland is completely dependent on the world market for its needs.

Says Halldór Jónatansson of the Ministry of Commerce: While population increased only 0.02% (to 174,000) from 1958 to 1959, imports of paper and board during the same period jumped nearly 38% to 8,914 metric tons.

Portugal

Changing picture of industry seen as big 1960-61 development

Population: 9,201,029. Per capita paper consumption: 22 lbs.
Paper and paperboard mills: 16; woodpulp mills: 2

Production	1958	1959
	(short tons)	
Paper and paperboard	89,980	95,590
Chemical, mechanical and/or groundwood pulp	65,780	76,560
Paper and board imports	14,740	15,290
Paper and board exports	12,870	9,570
Woodpulp imports	24,420	31,130
Woodpulp exports	35,750	39,490

Principal paper grades made: All grades
Principal paper imports from: Sweden, United Kingdom, France, U.S.A., Finland
Principal paper exports to: France, United Kingdom, Germany
Principal pulp imports from: Sweden, Norway, Finland
Principal pulp exports to: United Kingdom, France, Holland

—Lisbon

Production increases in the Portuguese pulp and paper industry during 1959 were modest.

Pulp output was up about 10,000 metric tons. This consisted of kraft and sulfite, with pine and eucalyptus as raw material. In spite of this increase, however, imports did not show a corresponding downward trend. On the contrary, shipments into the country were 6000 tons above 1958.

On the other hand, pulp exports maintained almost the same level as that of the previous year, being only slightly higher.

Paper production registered an increase of almost 5000 metric tons over 1958. The increase was most noticeable in newsprint. And as a consequence per capita figures rose to 22 lbs.

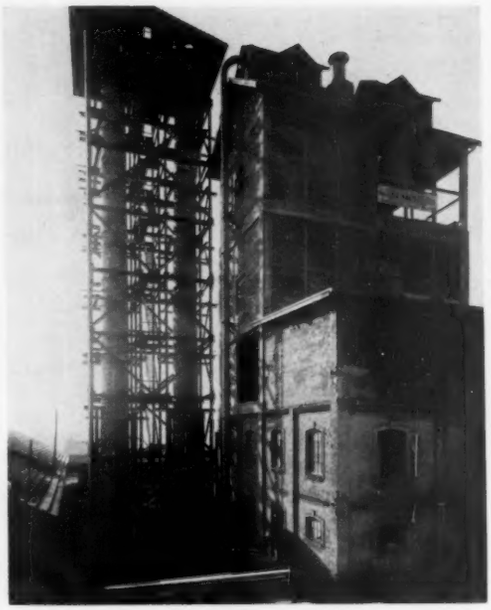
Two Pulp Mills Set

It is expected that during 1960-61 paper industry activity will take on a somewhat new appearance. Two pulp mills are currently being constructed. Rich deciduous woodlands will serve as raw material source. Much interest in these pulps has been shown by the

foreign market in recent years.

Societade Industrials de Celuloses' original plans called for either a 200-ton kraft mill or a 150-ton prehydraulized kraft mill at Setubal, 40 kilometers south of Lisbon.

North of Lisbon, Celuloses Portugaises added groundwood to its production during 1959. Products include kraft pulp and paper, kraft bags and newsprint. The nation's one internationally-known market woodpulp mill is that of Caima Pulp Co., producer of bleached eucalyptus sulfite. The firm was embarked on a program to double output during 1959.



CHEMICAL PULP MILL at Zagreb, Yugoslavia, was enlarged during 1959, and installed a new paper machine from Finland. The Zagreb Paper Mill recently celebrated its 65th anniversay.

Yugoslavia

Japan and West Germany will contribute to rapid growth

Population: 18,397,000; per capita paper consumption: 20 lbs.
Paper and paperboard mills: 11; woodpulp mills: 5

Production (short tons)	1958	1959
Paper and paperboard	169,179	219,180
Chemical woodpulp	108,764	121,700
Mechanical or groundwood pulp	54,316	56,200
Paper and paperboard imports	20,946	28,500
Paper and paperboard exports	4,899	8,250
Woodpulp imports	13,202	20,800
Woodpulp exports	28,975	30,000

Principal grades made: Newsprint, kraft, sulfite, book & writing, paperboard, tissues, cigaret and fine papers
Principal paper and paperboard exports to: U.S.S.R., Egypt, Syria
Principal woodpulp exports to: Poland, Uruguay, Italy, Austria
Principal paper and paperboard imports from: U.S.S.R., Finland, France
Principal woodpulp imports from: Austria, West Germany

By BOZIDAR STRAZEK
Editor for Yugoslavia

—Zagreb

Long term credits have been granted to Yugoslavia by Japan and West Germany to be used for two new mills which should boost paper and board output by 80,000 tons in the next two years.

One of these mills, under construction at Drvar, Bosnia, is Fabrika Celluoza Drvar AD, which was levelled by Allied bombers in World War II. It will cost $7 million and produce 24,000 tons of cellulose, the entire amount of which will be converted into writing, printing and high grade packing grades in its paper mill.

At Ivangrad, a 24,000 ton capacity pulp and paper mill has been financed by West Germany and will use West German and Finnish equipment. Cost: $9 million. A third new mill, to produce viscose, is expected to meet transparent cellulose sheet requirements for Yugoslavia and export another 100 tons a year.

1961 Export Plans

Under these ambitious plans, this country hopes by 1961 to run its export trade up to 20,000 tons from its present 8,000. Meanwhile it continues to be cognizant of the importance of the paper industry. Last year completed plant improvements shoved newsprint production from 74,000 to 77,000 tons, printing papers from 83,000 to 86,000.

BOZIDAR STRAZEK, in charge of construction and of imports of equipment for the Zagreb Paper Mills, one of the biggest in his country. He is editor for Yugoslavia.

Poland

Key to the future for the Poles is reforestation

Population: 28,059,000. Per capita paper consumption: 35 lbs.
Paper and paperboard mills: 58; woodpulp mills: 7

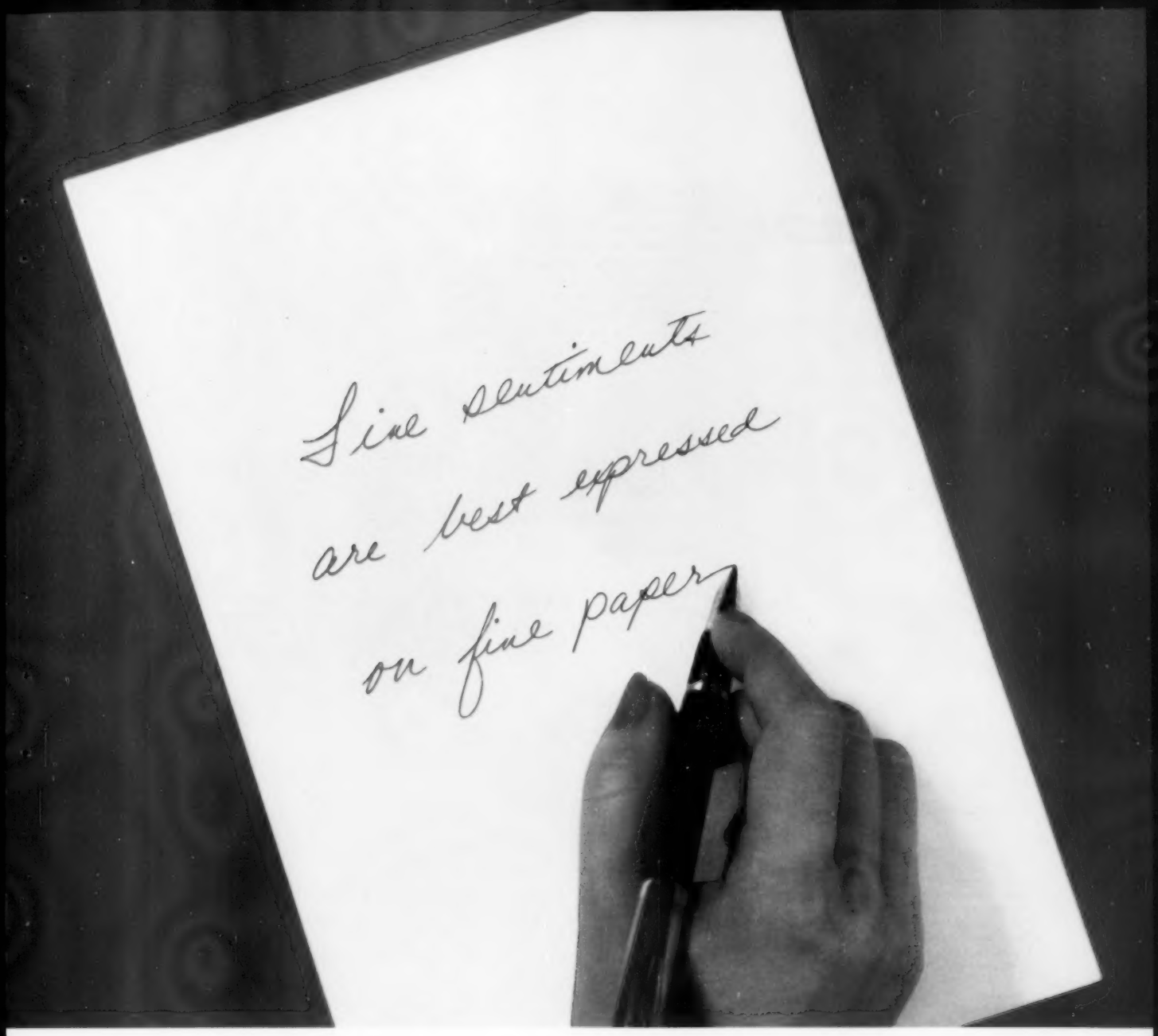
Production (short tons)	1958	1959
Paper and paperboard	475,200	480,000
Chemical woodpulp	258,500	260,000
Mechanical or groundwood pulp	171,050	173,500
Paper and paperboard imports	32,230	52,000
Paper and paperboard exports	32,890	33,900
Woodpulp imports	85,690	93,500
Woodpulp exports	3,190	—

Principal grades made: Newsprint, kraft, sulfite, book and writing, paperboard, tissues, cigaret and fine papers
Principal paper and paperboard exports to: U.S.S.R., Turkey, Hungary, Yugoslavia
Principal wood pulp exports to: East Germany
Principal paper and paperboard imports from: Finland, East Germany, Sweden
Principal woodpulp imports from: Finland, Yugoslavia, Norway

—Warsaw

Production has been "inching up" the line here but it is still far away from what is needed—a case which is hardly unique since it seems to apply to many nations.

Poland hopes to reach paper and board production of 810,000 tons a year by 1961, a 70,000-ton increase over this year's estimated production. If it is to accomplish this, the country must continue its efforts to reforest its lands, replace denuded forestlands and cultivate those which are not



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producing now. In the meantime, the Poles are looking to other areas, experimenting with sawdust and other fibrous materials to increase their pulp raw materials.

An indication of this lies in Poland's continued increase of pulp and paper and the downward trend of its export business. Last year, woodpulp shipments to other countries were off 9% and the percentage is increasing.

A 168-in. Fourdrinier machine manufactured by the British plant of Black-Clawson went on-line in one of Poland's newest mills last year and two others are scheduled for start-up soon in other mills. But production still lags behind the 35 lbs. per capita demand of its nearly 29 million people.

Bulgaria

Expansion eyed for proposed five-year-plan increases

Population: 7,722,000; per capita paper consumption: 17 lbs.
Paper and paperboard mills: 7; pulp mills: 1

Production (short tons)	1957	1958
Paper and paperboard	62,267	66,415
Chemical woodpulp	17,544	19,257
Mechanical or groundwood pulp	11,550	11,241
Paper and paperboard imports	26,785	23,851
Paper and paperboard exports	922	—
Woodpulp imports	26,675	16,449

Principal paper grades made: Newsprint, book and writing, cigaret and fine papers
Principal paper and paperboard imports from: U.S.S.R., Czechoslovakia, Finland
Principal woodpulp imports from: U.S.S.R., Czechoslovakia, Finland

—Budapest

The government of Bulgaria has taken under consideration a proposed straw pulp and paper mill and a cellulose mill to manufacture pulp from beechwood.

It seems probable that these two mills will be built, especially if Bulgaria is to meet the expansion in the pulp and paper industry called for in its current five-year-plan. A marked increase in pulp and paper production is anticipated by 1962. Paper and board are expected to rise from 79,000 tons last year to 215,000 tons; chemical pulp should be up to 89,000 tons from 21,000 last year and mechanical pulp is expected to go from 12,000 tons to 22,000 tons. Per capita consumption is also expected to increase to 33 tons from the present 17 tons a year (it was 8.3 tons in 1937).

There are now nine paper and cellulose plants in operation in Budapest manufacturing printing, writing, news, wrapping and packing board. There were five prior to World War II. Pulp and paper are both imported at present from U.S.S.R., Czechoslovakia and Finland.

Ireland

Capacity increases planned as production goes up 7%

Population: 2,853,000. Per capita paper consumption: 87 lbs.
Paper and paperboard mills: 5; woodpulp mills: 1; straw or vegetable fiber mills: 1

Production	1958 (short tons)	1959
Paper and paperboard	84,000	89,600
Chemical woodpulp	—	—
Mechanical or groundwood pulp	6,160	6,160
Straw or other vegetable fiber pulp	3,360	4,480
Paper and board imports	50,400	60,480
Paper and board exports	26,880	25,760
Woodpulp imports	26,880	33,600

Principal paper grades made: All kinds except tissues, cigaret and fine papers
Principal paper imports from: Sweden, Finland, U.S.A., Canada
Principal paper exports to: United Kingdom
Principal pulp imports from: Sweden, Finland, U.S.A.

—Dublin

Paper and board production climbed nearly 7% in 1959 to 80,000 long tons. Several companies are planning major capacity increases in 1960. Killeen Paper Mills Ltd., for one, hopes to boost paper and board output by some 3000 tons.

The country's principal producers are Killeen Paper Mills at Inchicore; Clondalkin Paper Mills Ltd., Clondalkin; Swiftbrook Paper Mills Ltd., and National Board & Paper Mills Ltd. All are members of the Irish Paper Mills Assn. Ltd. with headquarters in Dublin.

Good Year for Killeen

With three machines running at capacity for the last six months of 1959, Killeen Paper Mills enjoyed a year of high production. The firm expanded in the converting field with establishment of a small plant in Slough, Bucks, England. Paper and board is shipped from Dublin.

The three machines at Killeen are: (1) a 74-in. MG unit making bag and straw papers at an annual rate of 5000 long tons; (2) an 82-in. Fourdrinier making straw papers for corrugating at an annual rate of 6500 tons, and (3) an 86-in. six-cylinder board unit producing all types of chip, kraft and bleached liner boards at 10,000 tons per year. Killeen's total yearly output is therefore 21,500 long (24,080 short) tons.

A plant at the mill site turns out all types of corrugated boards, boxes and containers and solid board containers produced from board laminated on the machine. Total annual production is 15,000 long tons.

Kraft liner imported from the U.S. and Canada is fabricated in the Killeen corrugating plant. The firm produces its own fluting medium on its MG and Fourdrinier machines. Its bag factory produces at a yearly rate of 2,500 long tons.

A small mill turns out 5000 tons of straw pulp from locally-grown cereal straw; the equipment can be utilized in the production of an equal amount of semichemical woodpulp used in the production of fluting paper. Principal source of raw material is wastepaper obtained locally. Chemical pulps are imported from either the U.S. or Scandinavia.

Some 35% of Killeen production is exported—principally to the British market.

Rumania

Expansion continues rapidly as new materials are sought

Population: 18,059,000. Per capita paper consumption: 38 lbs.

Production (short tons)	1958	1959
Paper	260,000	263,000
Woodpulp	210,000	212,000
Paper exports	6,000	7,200

—Bucharest

Of all the East European countries, Rumania's development of pulp and paper products has possibly been the most rapid. Although the number of mills is not available, reliable reports indicate that Rumania is moving fast after a halting start.

Pulp production now stands at 212,000 tons, is expected to be up to 250,000 by 1965 with 300,000 tons in sight for 1970. To accomplish this, the Rumanians are working hard to develop new pulp fibers. A pulp and paper making center has been established in the Danube Delta to use reeds, a material which historically has been in very low harvest. At the same time efforts to increase the growth of this fiber continue.

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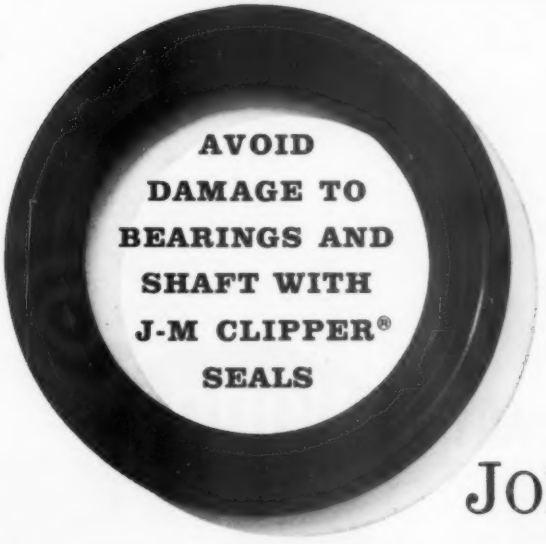

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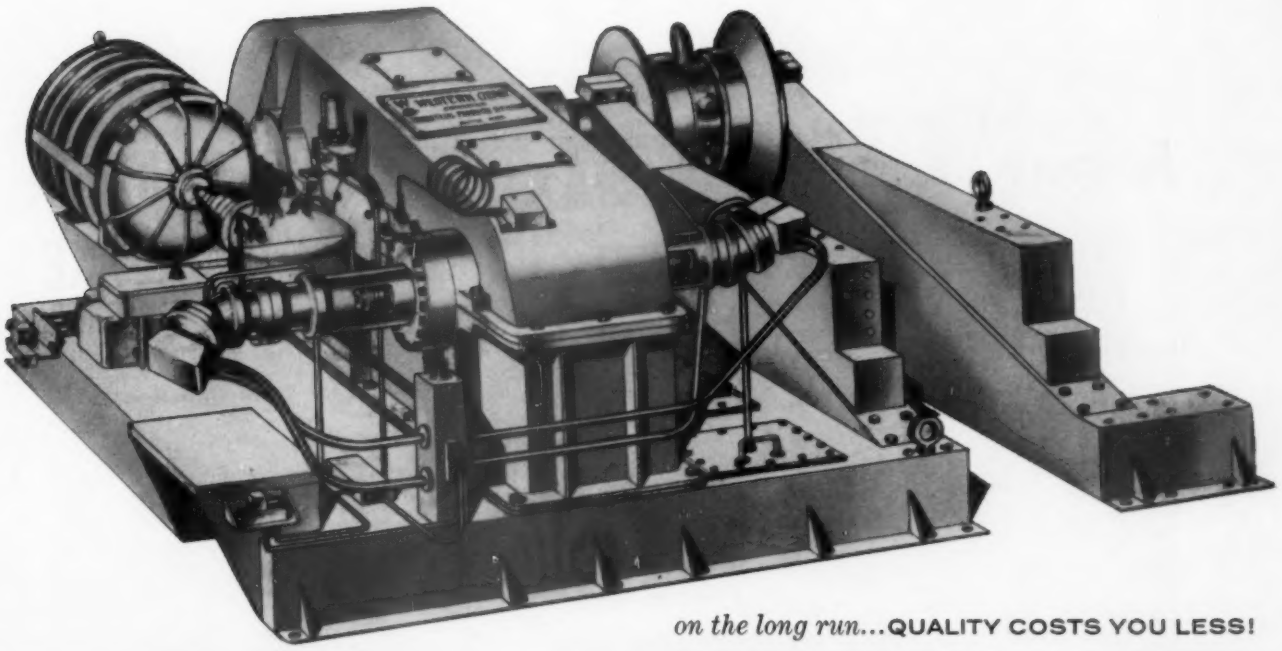

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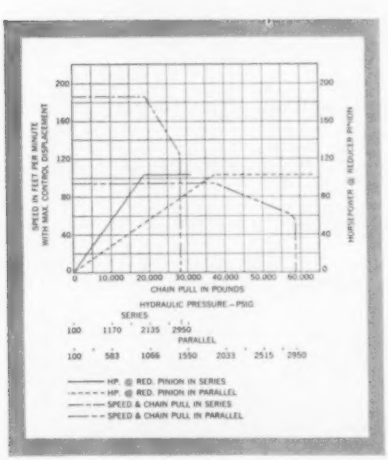

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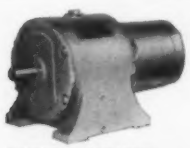
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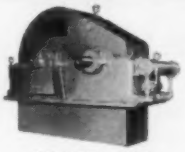
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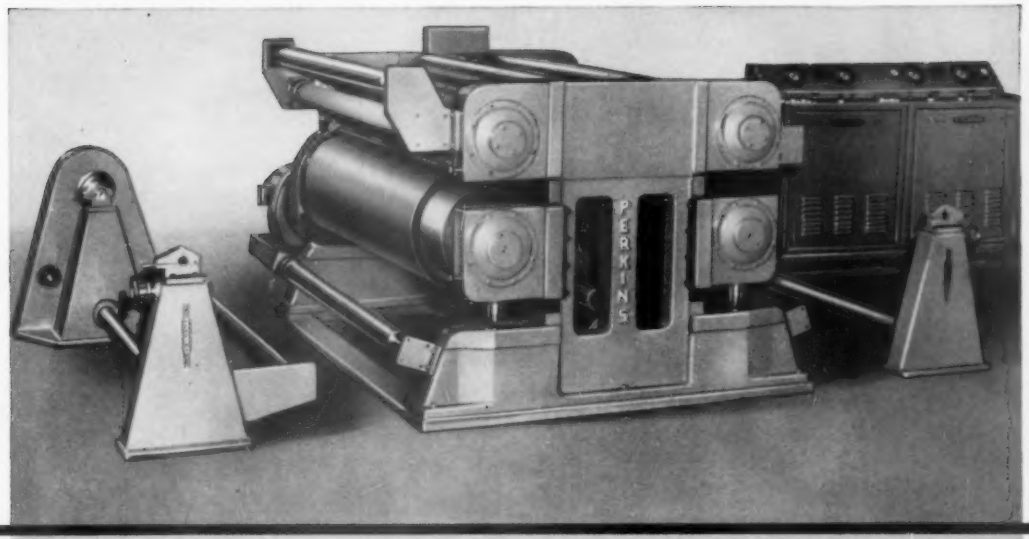

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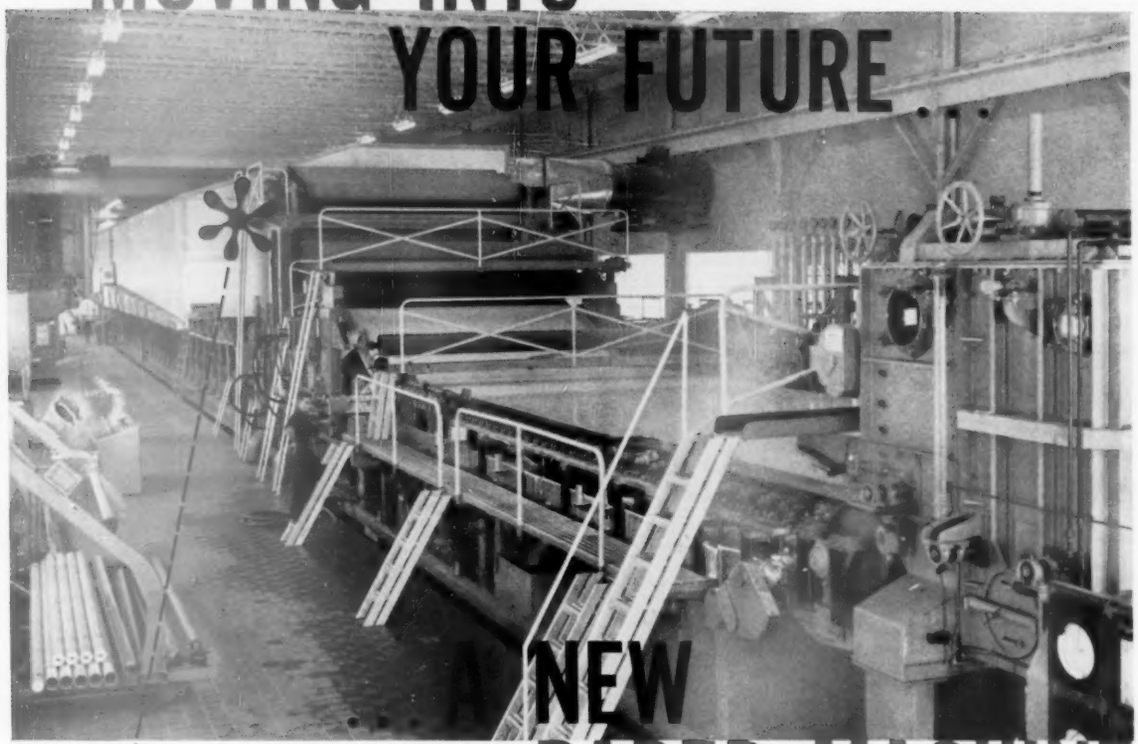

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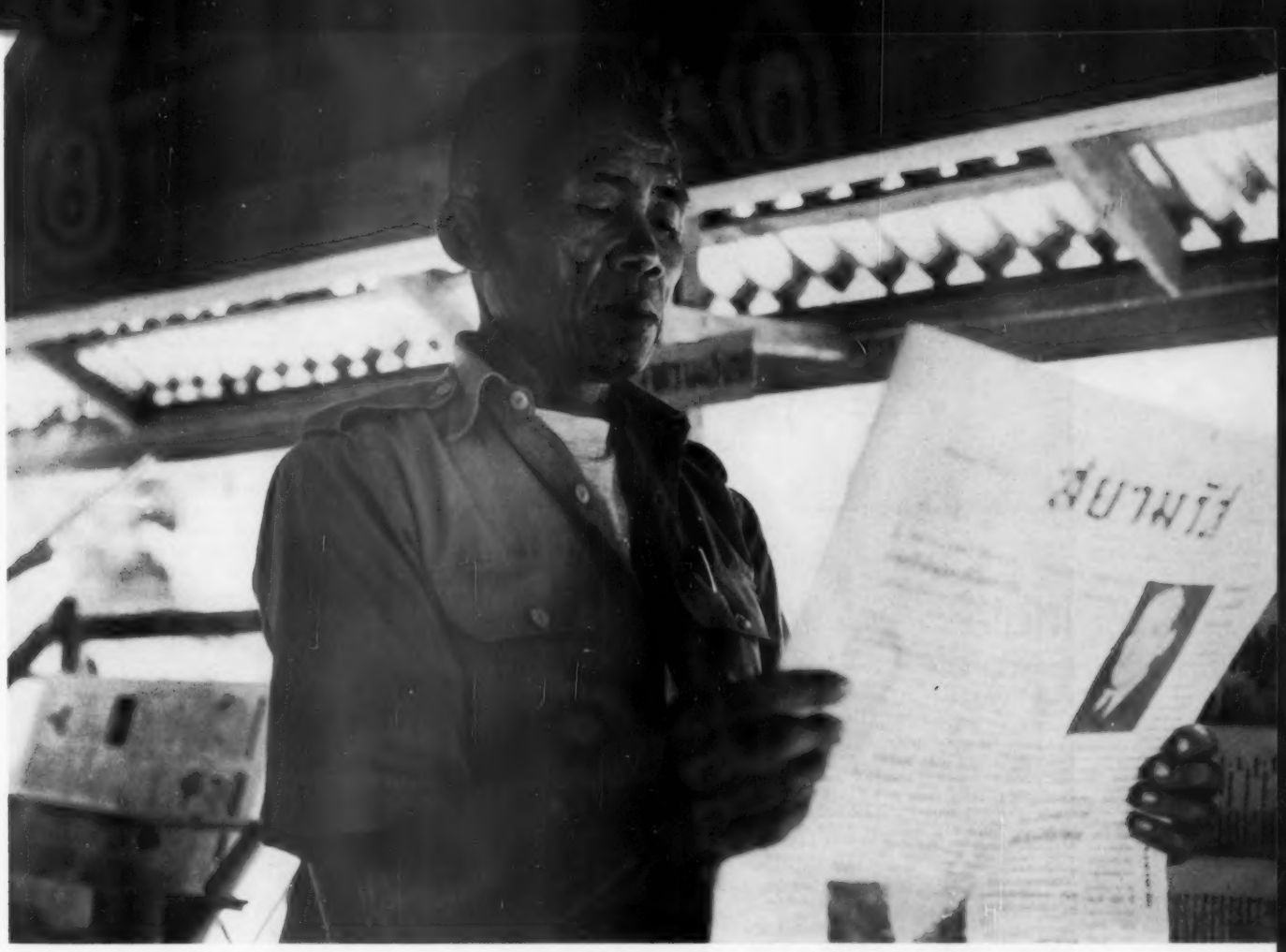

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in this section . . .

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ASIA

India

Better living standards boost paper production, consumption

Population: 400,000,000. Per capita paper and paperboard consumption: 2.1 lbs.
Pulp, paper and paperboard mills: 22; Strawboard mills: 5

Production (short tons)	1958	1959
Paper and paperboard	305,000	327,040
Chemical woodpulp	7,000	3,360
Mechanical or groundwood pulp	17,600	20,160
Straw or other vegetable fiber pulp	46,200	49,280
Paper and paperboard imports	80,000	101,920
Woodpulp imports	43,900	84,000
Paper and paperboard exports	2,100	1,792

Principal paper grades made: All kinds
Principal paper and paperboard exports to: Indonesia, Australia, Cambodia
Principal paper and paperboard imports from: Finland, U.S.S.R., China
Principal woodpulp imports from: Sweden, Canada, U.S.A.

By DR. J. C. AGGARWAL
Editor for Eastern India

—Raniganj, W. Bengal

Last year's production of 292,000 long tons was nearly three times the output of 1949. India is at present in the midst of her second Five-Year Plan. Target capacity for the paper industry at the end of this period is 450,000 long tons. This aim will undoubtedly be realized.

For the third Five-Year Plan the goal is 950,000 long tons.

Despite recent production increases, there remains an acute paper shortage. Because of the peculiar foreign exchange situation, India is unable to import pulp and paper in the needed amounts.

With living and educational standards increasing rapidly, per capita paper and paperboard consumption is constantly rising. However, the gap between consumption and domestic production is still wide.

Installed Capacity—360,000 Tons

There are 22 principal manufacturers in the country. These include three new units: West Coast Paper Mills Ltd. (Dandeli), Titaghur's No. 3 mill (Chowdwar) and the Western India Match Co. mill (Alambazar). Total installed capacity of the 22 plants is 360,000 long tons.

Percentage demand pattern, says the Indian government, is as follows: printing and writing papers (60%); packaging and wrapping (18%); paperboard (18%), and special papers (4%).

Of these, writing and printing papers are in the greatest scarcity, and it is understood that the government is planning to import these grades in considerable quantity.

Newsprint on Uptrend

Newsprint production increases each year. NEPA Mills in Madya Pradesh has proposed an increase in daily capacity to 200 tons; and three or four proposals for establishing 100-ton mills are being actively pursued. Under two of these schemes, newsprint will be produced from imported pulp that would be gradually replaced by domestic raw materials. One of the mills is to be built in Calcutta, the other near Bombay.

It has been estimated that India's requirement of rayon grade pulp will be nearly 74,000 tons by 1961, and this may well increase to 110,000 by the end of the third Five-Year Plan period. Taking shape is a plan for production of 100 daily tons from bamboo at a proposed mill in Kerala. The government has approved three more such proposals. And if such plans are fulfilled, it is predicted that the country will be self-sufficient in this respect by 1963.

Growing Need for Pulp

As numerous 5- to 10-ton paper mills are licensed by the Indian government, pulp requirements of course increase. Woodpulp is being imported at ever-increasing quantity; and to meet the demand locally Balmer Lawrie & Co. plans to build a 100-ton mill in Assam that will utilize bamboo.

Domestic production of straw and mill board has increased to nearly 120,000 long tons per year. Primary reason for such growth is the fact that board-making equipment is now manufactured in the country.

DR. J. C. AGGARWAL, editor for Eastern India, is with Bengal Paper Mill Co., Ltd., on the staff of the mill manager.

India cannot depend on importation of papermaking and pulp making equipment indefinitely. Two plans for manufacture of such machinery domestically have won government approval. It is hoped that the country will depend to a lesser degree on machinery imports in the years to come.

Bagasse Mill Set for 1961

Bagasse as raw material for papermaking is receiving great attention. Some, in fact, is already being used. Bagasse is available in such quantities that this source alone could support a 2,000,000-ton-per-year paper production. The Parsons & Whittemore/Lyddon Organization (U.S.A.) is now constructing a mill in southern India based exclusively on bagasse; it is expected to be in production next year.

Consumption Growth Continues

According to government estimates, rate of consumption will increase by almost 15% annually. Per capita use will be 41.03 lbs. in 1961; 47.3 in 1962; 53.65 in 1963; 60.84 in 1964; 68.57 in 1965, and 78.36 in 1966.

Says the Indian Institute of Public Opinion: there will be sudden changes

in consumption characteristics, and such an explosive trend is not unusual in a nation undergoing an industrial and economic revolution. In fact, effective demand for paper and board products may increase by nearly 22% annually.

Principal problems encountered in planning new projects are as follows: (1) raw material supply; (2) site selection; (3) selection of best adapted processing methods, plant and equipment; (4) detailed engineering; (5) execution of the project in the least amount of time, and (6) procurement of technical staff and skilled labor force.

DR. R. V. BHAT, editor for Western India, was for many years officer in charge of the Cellulose and Paper Division of India's Forest Research Institute in Dehra Dun. Recently he left this post to become works manager of the new West Coast Paper Mills at Dandeli.

By DR. R. V. BHAT
Editor for Western India

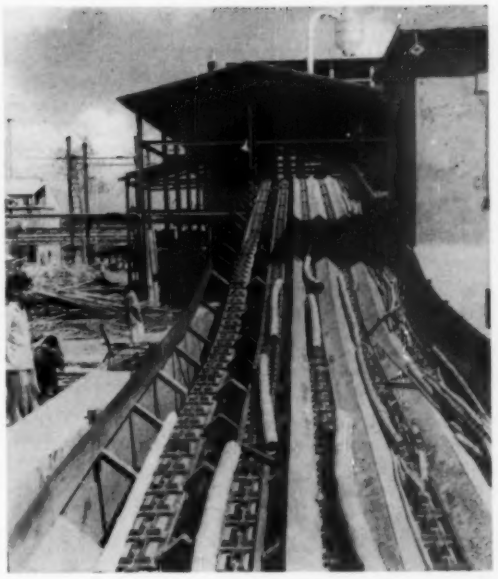
—Dandeli

In many respects, 1959 was notable for the Indian pulp and paper industry. Paper production soared to 292,000 long tons, and the output target of 350,000 by the end of March 1961 seems well within reach .

As a result of the government's drive for establishment of small-scale paper mills (5 to 10 tons daily), some 29 mills are expected to be built in various parts of the country. Their total production capacity is to be about 72,220 tons annually. As an aid to these small producers, the government has licensed four plans for production of papermaking machinery in relatively small plants. Two of these plans recently were put into operation with foreign collaboration.

Newsprint from Bagasse?

Today, India imports some 73,000 tons of newsprint each year, there being but one mill in the entire country equipped for its production and—that at a rate of 100 tons per day. A proposal for doubling this plant's capacity is now under consideration.



BAMBOO KRAFT MILL in India, West Coast Paper Mills Ltd. at Dandeli, makes bleached printing and writing and M.G. kraft papers from 100% bamboo fibers. Mill has two modern Escher Wyss 124-in. wire machines, plans big expansion program.

In addition, two 100-ton units have received government approval. These —in the private sector—will be located in Bombay and Calcutta and will initially use imported groundwood pulp.

Now under government study is feasibility of establishing in the public sector a newsprint mill based on monosulfite pulp from sugar cane bagasse.

Growth in Rayon Pulp

Rayon grade pulp is another commodity that currently needs to be imported in large quantities. Annual imports amount to some 40,000 long tons. Rayon manufacturing plants are being built, and manufacture of cellophane from viscose is on the increase. Consequently, the rayon grade pulp requirements are expected to rise to some 74,000 annual tons in future.

Currently, the country depends entirely on imports for its needs in rayon grade pulp. Three plans have therefore been approved by the government for domestic production from bamboo. Cotton linters are also being considered as raw material.

The government has also been encouraging production of specialty papers. One mill is manufacturing greaseproof from imported pulp, and one tissue mill has been licensed. Another firm plans production of photographic printing paper, while plans for producing cable paper and carbonizing tissues are under government study.

Paperboard Production Increase

Capacity of India's first hardboard plant is to be doubled to an annual 12,000 long tons. The mill located—near Thana (Bombay State)—will also turn out insulation board. And recently a second hardboard manufacturing facility went into production at Baliapatam (Kerala State) at a cost of Rs. 6,200,000 ($1,302,620).

Of the new projects, an integrated pulp and paper mill of 40-ton daily capacity has recently entered production at Chowdar (Orissa) and is based on bamboo.

Supplying Own Equipment

The Indian paper industry has been depending on imports for machinery and equipment. Annual requirements

INDIA—PAPER PRODUCTION
(in short tons)

	Printing and Writing	*Wrapping*	*Paperboard*	*Specialties*	*Total*
1946	71,390	17,257	20,446	7,506	116,599
1952	100,573	23,667	24,013	3,101	151,355
1953	107,103	23,144	21,853	3,830	155,930
1954	104,286	24,437	23,281	4,577	156,581
1955	133,836	31,716	35,240	6,279	207,071
1956	137,749	34,626	37,770	6,465	216,609
1957	141,111	39,738	44,850	9,643	235,341
1958	153,620	41,180	50,750	6,280	251,830
1959	197,120	61,824	61,936	6,160	327,040

are estimated at Rs. 300,000,000 ($61,030,000) for new mills, expansion projects and replacement. Steps have been taken so that in the next five years much of such equipment will be made domestically. Foreign builders are joining Indian firms in setting up fabrication plants.

Government Actions

During 1959, on government reference, the Tariff Commission suggested fixed prices for paper. The government then called on the mills to issue revised price lists to become effective January 1, 1960. The new prices are considerably below those in effect prior to the change. The industry has of course been seriously affected—new plants in particular.

The Government of India Panel for Pulp & Paper Industries, set up in 1957, has been recently reconstituted into a Development Council for Paper, Pulp & Allied Industries to advise the government on problems of raw materials, production, distribution, efficiency, training, research, labor, etc. Membership consists of mill representatives and the government departments concerned.

Pakistan

Attains self-sufficiency, is starting to export paper

Population: 85,635,000. Per capita paper consumption: 2 lbs.
Paper and paperboard mills: 4; woodpulp mills: 1; straw or vegetable fiber mills: 3

Production	1958	1959
	(short tons)	
Paper and paperboard	40,006	45,129
Chemical woodpulp	4,500	—
Mechanical or groundwood pulp	3,600	4,743
Straw or other vegetable fiber pulp	28,923	31,784
Paper and board imports	80,000	—
Paper and board exports	2,100	—
Woodpulp imports	43,900	—

Principal paper grades made: All kinds, 45,129; newsprint, 4,392; kraft, 5,950; book and writing papers, 20,142; paperboard, 7,593; tissue, 113; straw board, 5,463; corrugated board, 272; others, 1,204
Principal paper imports from: Sweden, Canada, U.K.
Principal pulp imports from: Sweden

—Karachi

The Pakistan Pulp and Paper Industry continued to make strides in 1959. Pakistan's entire requirements of printing, writing, wrapping papers, high grade and straw boards, mechanical printing and newsprint totalling over $12 million were previously imported.

Today the picture has changed. The country now has a production capacity of 25,000 tons of paper of different varieties and current annual production approximates 24,500 tons. After meeting local demand of 20,600 tons, an exportable surplus of 3,900 tons is available. Various export markets are being explored and several shipments have already been made to such countries as Malaya and Ceylon.

Certain special qualities of paper—bond, art, coated, tissue, typewriting, air mail, cigaret, currency, drawing and parchment papers and some other grades of fine papers are still imported, however.

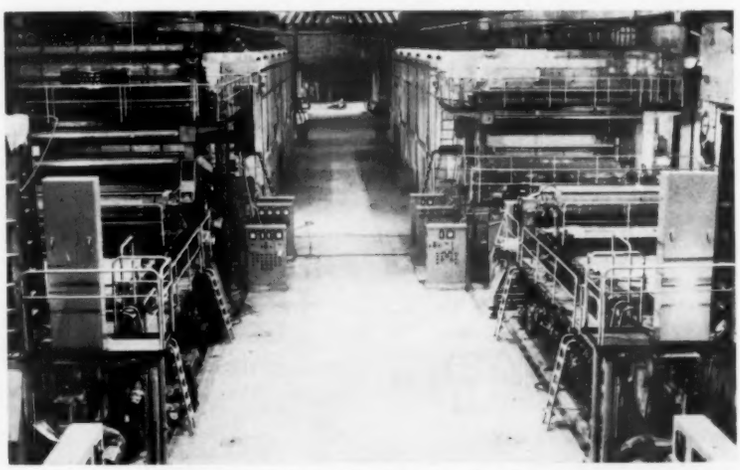
Further, a United Nations survey has estimated that by 1962 Pakistan will require 115,000 tons of paper, board and newsprint. In view of these facts, steps are being taken to expand the existing capacity of Pakistan's four mills and to establish new units.

The Pakistan Industrial Development Corp. is currently preparing a scheme for the establishment of two particle board and chip plants in East Pakistan. One of the plants would manufacture 10,000 tons of particle board per year and the other 8,000 tons of chip board annually.

The most important development in the Pakistan pulp and paper industry in 1959 was the commencement of operations of the Khulna Newsprint Mill. The project, which was completed at an estimated cost of $148 million, has an annual capacity of 23,000 tons of newsprint and 12,000 tons of mechanical printing papers. Utilizing the abundant local "Gewa" wood for raw material, the mill had reached nearly full capacity after its first eight months of operation. Present annual consumption of newsprint in Pakistan is about 8,000 tons—a per capita consumption approximating 2 oz.

The Sethi Straw Board Mill, Rahwali, reached full capacity in 1959 and in addition to straw board is now manufacturing corrugated, laminated and other boards. The Karnaphuli Mills, built in 1953, at Chandraghona, producing in 1959 some 28,000 tons of assorted papers is shortly expected to achieve its full capacity of 30,000 tons. The Adamjee Paper Board Mills, Nowshera, with a production capacity of 7,500 tons of high grade paper and board, produced 7,000 tons in 1959. New machinery has been added to expand existing capacity to 10,000 tons per annum by the end of 1960.

Pakistan's mills produced a total of 45,129 tons of all grades and types of papers in 1959. Its largest producer was Karnaphuli, which turned out 13,178 tons of printing paper, 6,462 tons of writing, 112 tons of tissue and 5,844 tons of wrapping papers. Second largest was Sehti Straw Board Mill, whose biggest product was straw board, 5,364 tons. They also made 1,182 tons of wrapping paper, 532 tons of paperboard and 267 tons of corrugating medium. Adamjee B/P Mills produced 6,924 tons of paperboard and Khulna turned out 4,214 tons of newsprint and 141 tons of writing paper.



NEWEST ADDITION TO PAKISTAN'S INDUSTRY is Khulna Newsprint Mill, which has two Wartsilä paper machines. The mill has annual capacity of 9,000 tons at present, is expected to increase eventually to 23,000 tons of paper, of which 12,000 will be newsprint.

NUMBER TWO PRODUCER IN PAKISTAN is Sethi Straw B/Mill in West Pakistan whose main product is straw board. It also produces wrapping, paperboard and corrugating medium.

Largest pulp producer was Karnaphuli which made 26,712 tons, followed by Khulna newsprint, 4,658 tons and Adamjee with 4,504 tons. Khulna also imported 5,038 tons of pulp and Adamjee 440 tons.

U.S. Helps Forestry Development

Through the auspices of the International Cooperation Mission, the U.S. has been assisting Pakistan in forestry development. Two projects are now underway: Forest management and establishment of a forest research laboratory.

Under these two programs, modern mechanical equipment is now being introduced to increase pulpwood operations, as well as the training of men in repairs and maintenance. Pakistanian foresters are being trained in aerial photography and work is nearing completion on the mapping of 300 acres of reserve forests. Advice and assistance is being rendered in the general field of forest management, research, education, protection and administration.

The U.S. has also suppiled equipment and technical assistance in setting up a modern forest utilization station to operate in five major fields: Veneer and plywood, woodworking and timber engineering, pulp and paper, wood preservation and wood seasoning; and timber testing. A division of forest management will be added later and the project should be completed by the end of this year.

PAKISTAN—Production
(in short tons)

Paper (Karnaphuli)	
1957	24,740
1958	26,000
1959 (estimated)	28,000
High Grade Board	
1957	4,500
1958	5,643
1959 (est.)	7,000
Straw Board	
1957	3,990
1958	4,762
1959 (est.)	6,000
Newsprint	
1957	—
1958	—
1959 (est.)	13,000

Japan

Economy continues upward climb; slow grades revived

Population: 92,970,000. Per capita paper consumption: 88.3 lbs.
Paper and paperboard mills: 636; woodpulp mills: 160; straw or vegetable fiber mills: 5

Production (short tons)	1958	1959
Paper and paperboard	3,296,000	4,219,000
Chemical woodpulp	1,780,208	2,300,711
Mechanical or groundwood pulp	825,037	1,005,314
Straw or other vegetable fiber pulp	9,541	8,910
Paper and board imports	5,950	8,380
Paper and board exports	112,242	120,845
Woodpulp imports	58,545	109,188
Woodpulp exports	5,543	5,721

Principal paper grades made: All kinds
Principal paper exports to: Hong Kong, Indonesia, Thailand
Principal pulp imports from: Canada, U.S.A., Finland, Sweden

By MOTOKI MATSUNAGA
Managing Director
Japan Paper and Pulp Assn.

—Tokyo

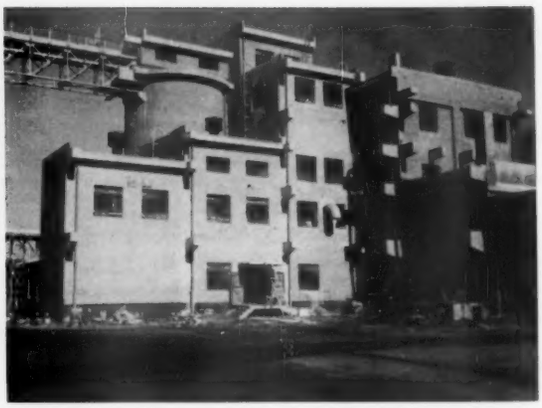
Japanese economy upturned from depression to fast recovery in 1959, due to steady expansion of world economy. Industrial production was 24% higher than 1958 with 11% growth in gross national product.

The paper and paperboard industry also showed improvement in output with 4,219,000 short tons (28% higher), delivery 4,180,988 short tons (24% higher), and export 116,812 short tons (8% higher). Stock increased 35% over 1958. Newsprint production increased 21% to 757,074 short tons and consumption 747,156 short tons (17% higher).

MOTOKI MATSUNAGA, our editor for Japan, has written the review material for this issue. He is managing director of the Japan Pulp & Paper Association.

Writing and printing paper were exported to West Germany, a member of the Common Market, but a new market in Europe remained to be developed. Kraft paper, one of the most favored grades in 1959, produced 305,337 short tons (39% higher) and delivered 303,103 short tons (34% higher). Paperboard marked a new high record in output, 1,459,445 short tons (41% up) and consumption 1,459,445 short tons (38% up). Production of linerboard rose by 65%, the highest percentage among all papers, and kraft liner manufactured by Honshu Paper Mfg. Co., using mostly hardwood, made its debut.

Total output of pulp was 3,287,059 short tons (26% higher), and dissolving pulp as well as paper pulp showed a sharp increase owing to the recovery of allied consuming industries. The operation rate of dissolving pulp also revived, but it is a matter of serious consideration how to co-ordinate domestic production and imports from Alaska Lumber and Pulp Co.



GROUNDWOOD FROM HARDWOOD CHIPS is being made in Japan based on Bauerite process developed at Gould Paper Co., U.S.A. Two of the mills using the process are (left) Daishowa Paper Mfg. Co. and (right) Tohoku Pulp and Paper Co.

As for pulpwood consumption, the trend to utilization of hardwood, waste and chips was apparent from the fact that increase of pulp production last year was made from these materials, while consumed softwood for pulp remained around the previous level.

To strengthen the competitive power of the industry in the international market, investment and equipment expansion toward modernization of pulpwood should be pushed at a greater stride.

Plan Asian Pulp-Paper Conference

In order to spread useful economic and technical information among the Asian and Far East nations and to expedite development of a pulp and paper industry in the region, the United Nations Economic Commission for Asia and Far East has recommended organization of a Conference on Pulp and Paper Development in Asia and the Far East under the sponsorship of ECAFE, BTAO (Bureau of Technical Assistance Operation) and FAO.

This Conference will take place in Tokyo in October 1960. Japan is expected to give enough experience and information to the Asiatic countries to expand and build new pulp and paper plants particularly in small scale mills. Japan has received a lot of inquiries on pulp and paper mills from India and other nations which urgently need many small paper plants of 5 and 10 tons daily capacity and use mostly non-wood fibrous materials such as bamboo, rice straw and grasses.

These individual inquiries on small scale mills, however, cannot be realized unless the government organization in the region should take the initiative to the extent of financial guarantee of new plants.

Along with the world-wide free economy and trade liberalization, the Japanese government has decided to remove import duties on raw materials and machineries as much as possible. Industrial people in pulp and paper are making ever increasing efforts toward reducing costs by improving techniques and rationalizing facilities and raw materials so as to meet the lifting of trade restrictions.

Productwise, the paper industry here continues to take forward steps. A new moistureproof paper, "Taifan," made by the Taiko Paper Mfg. Co., is attracting popularity in the food packaging industry because it keeps taste, flavor and contents in a fresh condition.

Annual linerboard production will probably increase by 30% this year. Demand is becoming so great that all linerboards are quickly sold out (30,000 tons a month.) There is a heavy market demand now for "K" brand linerboard by the Honshu Paper Co., used for packing vegetables and meat. They are presently producing 9,000 tons a month and have a $13 million expansion program under way, which includes a new machine.

JAPAN—PAPER PRODUCTION BY GRADES
(in thousands of short tons)

	Newsprint	Printing Paper	Wrap' Paper	Writing Paper	Other Paper	Liner Board	Other Board	Total
1955	507	578	63	270	360	199	452	2,429
1956	272	615	78	309	435	286	536	2,831
1957	613	700	71	372	493	379	636	3,264
1958	629	701	76	365	489	409	627	3,296
1959	762	865	89	467	594	676	766	4,219

JAPAN—PULP PRODUCTION
(in thousands of short tons)

	Sulfite (Rayon)	Sulfite (Paper)	Sulfate	Soda Other Chem	Wood Ground	Semi-Chem.	Total
1955	306	548	415	56	726	53	2,104
1956	408	550	538	62	788	82	2,428
1957	444	553	689	77	850	110	2,723
1958	317	474	811	85	797	131	2,615
1959	376	565	1,098	133	946	197	3,315

JAPAN—PAPER PRODUCTION, IMPORTS, EXPORTS, CONSUMPTION
(in thousands of short tons)

	Production	Imports	Exports	Consumption Total	Consumption per Capita (in lbs.)
1955	2,429	1	87	2,423	52.5
1956	2,831	1	117	2,715	60.1
1957	3,264	4	116	3,152	69.2
1958	3,296	6	113	3,189	69.3
1959	4,219	8	121	4,106	87.7

Turkey

Three new mills are planned, government encourages more

Population: 26,000,000. Per capita paper consumption: 8.58 lbs.
Paper and paperboard mills: 3, woodpulp mills: 1, straw or vegetable fiber mills: 2

Production	1958	1959
	(short tons)	
Paper and paperboard	68,944	67,247
Chemical woodpulp	18,661	17,697
Mechanical or groundwood pulp	24,615	22,344
Straw or other vegetable fiber pulp	3,532	3,125
Rag pulp	1,100	
Paper and board imports	35,123	44,773
Woodpulp imports	3,300	10,473

Principal paper grades made: All kinds
Principal paper imports from: Austria, Sweden, Norway
Principal pulp imports from: Sweden, Russia, Finland

—Ankara

In line with the economical, cultural and industrial development of Turkey, demand for paper, paperboard and paper products has been increasing continuously.

Cognizant of this, the Turkish government is playing an active role in encouraging expansion of Turkey's paper industry. Indicative of the reaction is the announcement that machine and equipment orders have been placed with Metex, a Finnish organization representing 42 of the top industrial companies of Finland, for expansion of the mill at Izmit, Turkiye Seluloz ve Kagit Fabrikalarai Isletmesi (SEKA).

The actual paper consumption of Turkey in 1959 is estimated at about 110,000 short tons. Of this, 61,134 tons is produced in existing pulp and paper mills at Izmit and the remaining must be imported. It is difficult to know exactly the potential demand which would exist if paper were in normal supply. It has been estimated, however, based on the current per capita demand of 3.9 kg. and the fact that present industrial and economic developments could easily increase this demand to 8 kg., that consumption could rise to more than 200,000 short tons.

Expansion of the industry here is the obvious answer to this problem and raw material is abundant enough to support such an expansion. This is the reason the government is making every effort to encourage expansion such as the one at Ismit, which will push production up to 110,000 short tons. Expansion of the SEKA mill is expected to be completed in 1961.

Plans are also being made to build two more pulp and paper mills at Filyos, in northern Turkey, and Tarsus, in Southern Turkey. The Filyos project will have a capacity of about 45,000 tons of kraft pulp and paper and will use 60% hardwoods, 40% softwoods in continuous digesters. The Tarsus project will produce about 30,000 tons anuually of printing, writing, fruit wrapping and glassine. It will also use continuous digesters and mix agricultural residues such as straw, cotton, rice straw, etc., with about 20% softwoods.

Details for these two mills have been completed and they will probably get underway in the near future. Target date for getting both these new projects "on-stream" is 1965.

EXPERIMENTAL FOREST IN TURKEY operated by the Turkish government with technical assistance from FAO. They hope to decrease imports of woodpulp by 25% as result of forestry program. (United Nations photo)

South Korea

Building materials plant is slated here by U.S. firm

Population: 22,655,000. Per capita paper consumption: 5 lbs.
Paper production: 16,500 tons
Pulp production 7,700 tons
Paper imports: 5,500 tons
Pulp imports: 6,600 tons

—Seoul

Development Loan Fund has approved a $1.1 million loan to Tec Pan Industrial Corp. of Seoul to be used in establishment of a building materials plant based on rice straw.

This product was developed by Tectum Corp. of Columbus, Ohio, U.S.A., following a survey on the needs of housing and building materials. Tectum will act as consulting engineers on the project.

Two paper mills are also slated for startup soon, boosting the present 100,000 ton capacity of the 25 paper mills in operation by about 16%. Nankuk Special Paper Mfg. Co. will have a 6600 short ton annual capacity, producing on an 88 in. Fourdrinier. The other mill, Dai Han Paper Mfg. Co. in southeast Seoul, will produce about 8800 tons a year.

Majority of the mills produce wrapping paper, with two newsprint mills making about 30,000 tons a year. Its newest mill, owned by the Government Printing Agency, is in full operation manufacturing currency and cigaret paper. Normally, South Korea imports $900,000 worth of currency paper and $500,000 worth of cigaret paper a year.

Hong Kong

Remains export-import center

Population: 2,806,000; per capita paper consumption: 47.4 lbs.

	1957	1958
Paper imports	92,721	84,810
Paper exports	35,978	19,470
Paper consumption	56,743	65,350

Principal paper imports from: China, Japan
Principal paper exports to: South Korea, Thailand, Indonesia, China

—Hong Kong

This city remains basically an importer and an exporter, although its paper consumption continues to rise and, resultingly, its exporting drops. In 1958 its exports decreased 15,440 tons a year. This year they dropped 12,500 tons. Correspondingly, imports have also reduced to a degree.

Paper importing by Hong Kong is still dominated by China, which ships

in 25,000 tons of newsprint; 15,000 tons of writing and printing papers; 13,000 tons of wrapping. The remainder of its chief imports come from Canada, Scandinavia (mostly Sweden), U.S.A. and Austria.

Last year Hong Kong exported some 6,000 tons of news and 9,000 tons of strawboard to Thailand, another 3,000 tons of paper and board to Malaya.

Vietnam

Plans for mill in southeast

Population: 14,000,000. Per capita paper consumption: 3.2 lbs.
Paper imports, 25,000 tons.
Pulp imports, 900 tons.
Paper production: 1,200 tons.
Exports of paper to: Cambodia and Laos.
Woodpulp imports from: Sweden.
Paper imports from: W. Germany, Norway, Sweden.

—Saigon-Cholon

Over 40% of the 65 thousand square miles of land area in the Vietnam republic is covered with forests. The species are largely pines and bamboo, which are considered suitable for pulping, and there is discussion of a pulping industry, but nothing has come of this as yet.

The greatest interest for a pulp and paper industry is centered in the southeastern part of the country, around Dalat. For over two years there have been discussions of a possible project there.

Like other Asiatic countries, there are small hand-made paper operations for ceremonial or other papers.

Iraq

Possibility of reed mill

Population: 7,000,000. Per capita paper consumption: 7.54 lbs.

	1958	1959
Paper and board imports (short tons)	25,300	26,400

Principal paper imports from: Finland, Sweden

—Baghdad

It now appears that Iraq may soon have its own mill producing pulp from its own abundant reed harvest. Preparation and general specifications for such a mill have already been drawn up.

Iraq has an area of some 625,000 acres north of Bassorah which is thick in reeds and grasses. Surveys have indicated they are suitable to yield about 200 cu. meters or about 10 tons of paper grade pulp per hectare. (There are 250,000 hectares in 625,000 acres.)

Studies on the pulping characteristics of reeds were made by l'École Française de Papeterie in Grenoble, France and also at Stockholm, Sweden.

The designed mill now under serious consideration will probably be built at Bassorah and is designed to produce about 40,000 tons a year of various paper and paperboard grades. This will satisfy the current demands of the country.

Iran

New mill operation set for late 1960. Consumption up

Population: 20,900,000. Per capita consumption of paper: 4.4 lbs.
Paper and paperboard mills: 5; under construction: 3

	1958* (short tons)
Production	
Paper and paperboard	3,410
Paper and paperboard imports	42,900
Wood pulp imports	800

Principal paper and paperboard imports from: U.S.S.R., Sweden, Norway
Principal woodpulp imports from: United Kingdom
***Latest available statistics**

—Teheran

Operation of a new writing and kraft paper mill producing an annual 4500 metric tons is expected late this year.

As of 1958 (the latest statistics now available), five mills were producing an annual 2700 metric tons paperboard, 100 metric tons kraft paper and 300 tons newsprint.

Paper and paperboard imports during 1958 totaled 39,000 metric tons.

It is estimated that consumption of paper and paperboard products will be doubled within the next five years. In accordance with a general plan for industrial development, private investors are being encouraged to place capital in the domestic industry.

Some firms have already expressed interest in the field. These include Alen (U.S.A.), Empacel (French) and a Japanese company.

The five-year aim in Iran is for an annual output of 80,000 metric tons paper and paperboard.

MR. LAI SHEN-LING is chairman of the Taiwan Paper Industry Association and chairman of the board of directors of Taiwan Pulp & Paper Corp.

Taiwan

Production and expansion both continue to grow

Population: 10,499,541. Per capita paper consumption: 28.19
Paper and paperboard mills: 53; straw or vegetable fiber mills: 1 (bagasse)

Production	1958	1959
	(short tons)	
Paper and paperboard	101,341	126,323
Bagasse and other pulp	13,015	20,388
Paper and board imports	9,920	7,720
Paper and board exports	4,410	6,620
Woodpulp imports	6,610	4,410
Woodpulp exports (bagasse)	1,110	2,210

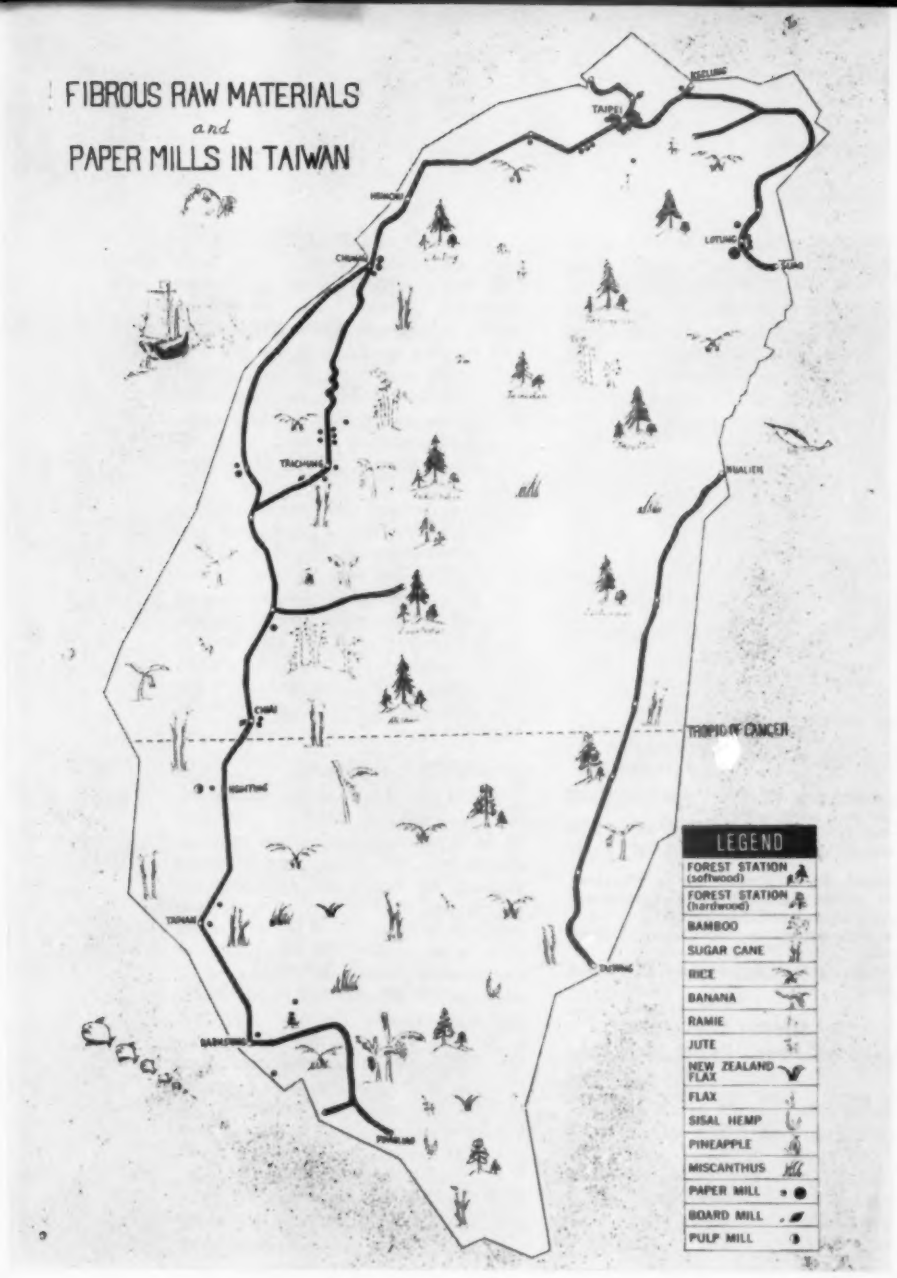
Principal paper grades made: All kinds, newsprint, kraft, book and writing, paperboard, tissues, cigaret and fine papers
Principal paper imports from: Japan, U.S.A.
Principal paper exports to: South Korea, Hong Kong, Thailand, South Vietnam
Principal pulp imports from: Finland, Canada
Principal pulp exports to: Japan, Philippines (bagasse pulp)

—Taipei

Taiwan's paper industry continues to be active and aggressive, this past year outdistancing the predictions for production made in 1958. It has been estimated that top production for 1957 would be 77,000 tons of paper, whereas 100,000 tons was produced. Total production for pulp and paper in 1960 is expected to equal or exceed the record 1959 figure.

Exports of paper and board go principally to Korea, Okinawa and the Ryuku Islands. Total exports proceeds from newsprint, simili paper, tissue, paperboard and bleached bagasse were expected to reach $6,000,000.

Technically great progress was also made. The Hsinying Pulp Mill has started up a new plant for making white board of bleached bagasse. To accomplish this, three 15-ton/day refiners with 75 hp drives and two 15-ton jordans were added. A board



machine equipped with 124-in. Fourdrinier wire, suction couch roll and 10-roll calendar was also started up. It has a speed of 85 to 100 fpm and will produce about 15 tons a day. A rebuilt slitter and cutter was also added and plans for installing a coater have been announced.

New groundwood equipment has been added at the Lotung Paper Mill to meet increasing demands for newsprint. The four-pocket grinder was supplied by Norton Co., U.S.A., and is a 59-in. dia. machine driven by a 900 hp motor. It will boost production to about 3,900 tons a year.

Formosa's newest mill is Longlived Pulp and Paper Corp., located in the Miaoli district. It produces bond papers and tissue from bamboo. Its 86-in. Fourdrinier-Yankee machine was supplied by Ito Iron Works of Japan. About 3,000 tons of tissue and 800 tons of heavier papers are manufactured annually.

In all, there are more than 50 mills on the island, including many small mills with a capacity ranging from one to 100 tons a day. Total capacity is 506 short tons a day of paper, 110 short tons of board and 143 tons of bagasse pulp.

Mr. Lai Shen-Ling, chairman of the board of directors of the new Taiwan Pulp & Paper Corp., has been elected chairman of the Taiwan Paper Industry Association.

TAIWAN—PAPER PRODUCTION
(in short tons)

	Paper	*Board*
1946	5,483	1,935
1947	9,784	4,397
1948	14,086	4,487
1949	14,646	4,520
1950	15,296	3,879
1951	18,038	5,511
1952	28,503	6,291
1953	31,829	6,659
1954	39,270	8,334
1955	45,142	11,649
1956	56,493	11,101
1957	63,511	11,209
1958	85,227	16,014
1959	100,033	26,290

Nepal

Attractive untapped resources

Population: 9,000,000; Per capita paper consumption: 2 lbs.

—Khatmandu

Nepal is still struggling for recognition by industrial development groups but as yet its attractive natural resources are untapped. The government offers tempting lures: 99-year leases on state-owned forests are available; it has a band of virgin forestland 10 miles deep and 500 miles long; wages are low and productivity high and its people—never dominated by another country—are friendly. In addition it has no trade barriers with India, making its arrangement to use the Port of Calcutta as a shipping point attractive.

To date, only two sawmills have taken advantage of these factors. They produce 200,000 cu. ft./year of lumber. ICA has signed an agreement to build a sawmill which will produce a million cu. ft./yr. using 80% hardwoods. Operations will begin next year.

Indonesia

Still struggles to gain its place in the new Asia

Population: 86,900,000; per capita paper consumption: 3.2 lbs.
Pulp and paper mills: 2
Paper production: 5,000 tons
Paper imports: 95,000 tons

—Jakarta

Indonesia today lacks just about everything it needs to occupy a substantial position in the world community of independent nations—except raw materials. Furthermore, its import restrictions are holding down paper consumption to 100,000 tons a year, accounting for its low per capita consumption of less than 4 lbs. a year.

Still, Indonesia has a virtual bon-

anza in its 232 million acres of forest lands which, although primarily mixed hardwoods, could be developed into a profitable lumber industry. Another 130,000 acres of pine are available in northern Sumatra. Then, too, there is bamboo which grows to a cutting stage in 10 years. Most of the bamboo is now used for housing, but profitable pulp and paper nurseries could be quickly cultivated.

Paper production at present is limited to a meager 5,000 tons. It is produced from a variety of materials—rice straw, bamboo, bagasse and a minor amount from hardwoods.

Indonesia's greatest problem is education, a problem slowly being overcome. Its No. 2 headache is development of its resources, in which it is far richer than many of its neighbors.

Malaya

New mills to be tax exempt; interest is keen

Population: Federation of Malaya, 6,698,000; State of Singapore, 1,580,000. Per capita paper consumption: 13.7 lbs.
Straw or vegetable fiber mills: 1

Production (short tons)	1958	1959
Paper and board	300	300
Straw or fiber pulp	150	150
Paper and board imports	39,000	50,800
Waste paper imports	16,728	19,030

Principal paper imports from: Japan, Norway, Finland, China, United Kingdom

—Kepong, Selangor

No concrete developments have taken place as far as paper development goes but interest is keen since the government has gazetted the pulp and paper industry as a pioneer industry. This qualifies it for a five-year tax exemption.

Combined with the fact that several raw materials are available for pulping, this tax exemption bodes good things in the wind for Malaya. One project could be the manufacture of writing and printing papers from padi straw and bamboo. Also possible is the use of pineapple leaves and lalang for chemical pulping and rubberwood for mechanical pulping.

The possibility of a large integrated rubber and rubberwood pulping industry has also been suggested in a report by J. D. Peel, chemist for the Forest Research Institute of Malaya.

Malaya imports about 40,000 tons of new paper, 17,000 tons of old newspapers and 9,000 tons of fiberboard a year. The only mill making paper in the Federation produces a variety of boxes, wrapping, toilet and joss papers. It uses mostly waste paper to produce its 300 tons a year.

Israel

Increased use of domestic raw materials keys new expansions

Population: 2,100,000; Per capita paper consumption: 61 lbs.
Paper and paperboard mills: 3

Production	1958	1959
	(short tons)	
Paper and paperboard	28,000	32,000
Paper and paperboard imports	31,000	29,000
Woodpulp imports	22,000	23,000

Principal paper grades made: Newsprint, kraft, sulfite, book and writing, paperboard, tissues, cigaret and fine papers
Principal paper imports from: Finland, Sweden
Principal pulp imports from: Finland, Sweden

By SIMON SCHMIDT
American Israeli Paper Mills Ltd.

—Hadera

Israel now has its first fully integrated pulp and paper mill, capable of converting domestic straw and cornstalks into newsprint, wrapping papers and such finished products as paper napkins and towels.

As a result of a $12,000,000 expansion, American Israeli Paper Mills Ltd. has doubled annual production capacity (passing the 40,000-ton mark); introduced a new series of paper grades; established Israel's first pulp mill; improved quality control by installing additional electronic equipment and research laboratories, and is constructing its own independent power supply. AIPM assets now total $20,000,000.

The expansion included a complete rebuild of the No. 1 paper machine and construction of No. 2, a 138-in. Beloit. Both are now turning out paper of various specifications, ranging from 30-300 gm per sq. meter, including book, bond, kraft and sulfite wrapping, newsprint, manifold, tissue, fruit wrap, duplicating and offset papers plus a complete line of consumer products.

Israeli-U.S. Cooperation

AIPM was able to utilize local straw and cornstalks to produce over half its bleached and unbleached pulp requirements only after comprehensive research by Israeli and American scientists and technicians who devised methods to make use of the raw materials economical. The remainder of the needed pulp will continue to be imported. Utilization of local straw and cornstalks by the new pulp mill is yielding Israeli farmers about $1,000,000 a year. Meanwhile, intensive research is continuing in the search to produce additional locally-grown pulp-yielding materials.

Dollar savings to Israel as a result of the expansion amounts to $4,000,000 annually, an important development for a country striving to achieve

INCREASING AMOUNTS OF LOCALLY-PRODUCED RAW MATERIALS are being utilized by American Israeli Paper Mills Ltd., Hadera. Firm—expanding steadily since it was established in 1953—recently put new pulp mill into operation.

economic self-sufficiency. Furthermore, the pre-expansion staff of some 250 workers has been doubled.

Supermarkets, Better Living

A rising standard of living in the young state has resulted in a rapid increase in the per capita consumption of paper, which has jumped to 61 lbs., placing it well ahead of many European and South American countries. Improved marketing methods and growth of supermarkets, greater use of paper by the food and allied industries—these are a few of the reasons for the continuing increase in paper sales in Israel.

American Israeli Paper was founded in 1953 as the country's first paper mill and has been growing rapidly ever since. The current expansion and diversification will put the firm in a position to supply nearly all of Israel's paper needs. One effect of the young firm has been a noticeable raising of the hygenic standards of Israel. In addition, the plant has vastly improved import-export balances, and has directly and indirectly given employment to many people.

By M. KAISER
Director, Paper Div.
Ministry of Commerce & Industry

—Jerusalem

General consumption of paper and board for 1960 (for both local and export market) has been estimated at about 68,000 tons, of which some 50,000 will be consumed locally.

The 68,000-ton total consists of about 40,000 tons of Israeli production, the remaining 28,000 imported. To meet pulp requirements, some 24,000 tons will be imported; domestic production will account for 10,000, while 9,000 tons of wastepaper will be utilized.

Mills Expand

American Israeli Paper Mills Ltd. is well embarked on its extensive expansion program that was undertaken late in 1959.

Gveel Paper & Board Mills recently began production of duplex board. It is hoped that import of this grade can be discontinued in the near future.

Supra Paper Mills hopes to supply the local market with creped toilet tissue from wastepaper with only a small addition of pulp.

These two smaller mills have increased capacity and improved quality with installation of new equipment and far-reaching modernization and improvement programs.

Israel looks to the day in the not-too-distant future when domestic pulp and paper production will meet some 60% of local needs.

HARDBOARD PRESS at Sefen wallboard factory in Afiqim, Israel, has pneumatic loading equipment. (United Nations photo)

Ceylon

Per capita consumption rises 20% from 1958

Population: 8,700,000. Per capita paper consumption: 6.1 lbs.
Paper and paperboard mill: 1. Straw pulp mill: 1

Production	1958	1959 (short tons)
Paper and paperboard	1,669	4,696
Straw pulp	750	1,217
Paper and paperboard imports	22,000	22,000
Woodpulp imports	330	3,191

Principal paper grades made: Kraft, book and writing, paperboard
Principal paper imports from: Japan, Europe
Principal woodpulp imports from: Russia, Sweden, Canada

—Colombo

Relying to a considerable degree on the island's one straw pulp mill for raw material, Ceylon's only paper mill —Eastern Paper Mills Corp. at Colombo—showed a production increase of more than 200% in 1959.

Local straw pulp output totaled 1087 long tons, while pulp imports amounted to 2849 tons. No suitable domestic wood fiber for pulp manufacture has as yet been found.

Eastern Paper Mills was built by the government in 1948 and turned over to the present operating corporation (a government group) in 1955.

Paddy straw and illuk grass (Imperatta arundiacia) are the only locally-produced raw materials for pulp, most of the island's cultivated land being used for food—among which are tea, coconut products, rice, fruits, cinnamon and citronella.

Thailand

Expansion is under way

Population: 23,500,000. Per capita paper consumption: 5.1 lbs.
Number of woodpulp mills: 1. Number of paper mills: 2.

Production:	1958	1959 (short tons)
Paper and paperboard production	3,092	2,847
Chemical pulp production	2,701	2,417
Paper and paperboard imports	47,854	57,303
Pulp imports	66	52

Principal grades made: Book and writing papers.
Leading nations supplying woodpulp imports: U.S.A., Taiwan.
Leading nations supplying paper imports: Japan, The Netherlands, United Kingdom.

By REAR ADMIRAL CHALIE SINDUSOPON
Under Secretary of State for Industry

—Bangkok

There is considerable opportunity for pulp and paper growth in Thailand and prominent foreign engineers have made surveys here indicating the bamboo use may be increased.

At present there is a mill under construction to use vegetable fibers. There is one paper mill already supported by

a bamboo pulp mill at Kanburi, 75 miles from Bangkok. Another paper mill is very old and makes only about one ton a day, and is actually primarily a pilot plant. It uses waste paper to make printing papers.

The larger mill makes eight to ten tons a day.

The proposed new mill would make about 40 to 60 metric tons per day by the end of 1961.

We are now dealing with the development of the pulp and paper industry, which applies to both the possible modernization and expansion of the existing mills and the creation of the new mill. We are trying to expand the production of the existing mill from 8 or 10 tons a day to 25 tons, and then to 50 and finally, 100 tons a day. We are very confident of eventual success for our plans, which will mean a great deal to the economy of Thailand.

Almost 70% of this kingdom, which covers 200,000 square miles, is heavily forested. About 50% is accessible.

INCREASING PAPER USE IN BURMA is aided by Burma Translation Society, working with UNESCO and other international advisers to bring up-to-date publishing operations to the Burmese people. Here, press sheet is studied in new BTS printing plant. (United Nations photo)

Burma

Bamboo-based industry still aim of government

Population: 20,255,000. Per capita paper consumption (1958): 2.13 lbs.

	1958 (short tons)
Paper and paperboard imports	21,514

Principal paper and board imports from: United Kingdom

By MAI AUNG
Editor for Burma

—Rangoon

Establishment of pulp and paper production based on bamboo remains a primary aim of the Union of Burma. It is hoped that a foreign company will cooperate with the Burmese government in a joint venture.

Past surveys indicate that Burma's bamboo forests are among the best in the world. Yet the nation supports no pulp and paper production—with the exception of a small handmade paper industry located along the 300-mile Chinese frontier. This output is primarily consumed as wrapping paper in the mountains of northeast Burma, as well as in manufacture of umbrellas. (Raw material for this ancient production consists of certain barks boiled with wood ashes containing potash.)

Otherwise, Burma's paper requirements are imported.

Hardboard from Bamboo

A newly organized company is planning to manufacture hardboard in Rangoon. Raw material will be bamboo. This results from a joint venture by which the Union of Burma Applied Research Institute was granted a patent by the U. S. Patent Office for manufacture of pulp and paper from shredded bamboo. It is hoped that this venture will go into operation before the end of the year.

Another firm is planning a paperboard mill near Moulmein.

Import statistics for 1959 are not as yet available.

Lebanon

Depends on imports mostly but consumption is rising

Population: 1,500,000. Per capita paper consumption: 23 lbs.
Paper production: 1,185 tons.
Imports: 15,680 tons.
Principal imports from: Austria, Sweden, Finland, U.S.S.R., Czechoslovakia

—Beirut

The Republic of Lebanon has a higher per capita use of paper than many of the countries in this part of the world. It is now about 23 lbs. per person.

About 700 tons of paperboard and 200 tons of newsprint are made annually in this country and the bulk of paper must be imported. About 600 tons of paper are exported to nearby countries.

There are practically no forests and no resources so imports will be an important source of supply for many years.

Cambodia

Small mill is started

Population: 4,900,000. Per capita paper consumption: 4 lbs.
Imports of paper: 5,000 tons.
Imports from: France, Hong Kong, Singapore.

—Phnom Penh

Cambodia's 150,000 square miles is more than 50% forested. Only about one-third of the total land area, however, supports a dense forest suitable for major exploitation.

The largest and most important block of dense timberland borders the Gulf of Siam. This tract, which is accessible to the new seaport at Sihanoukville, contains pine as well as a great variety of tropical hardwoods. Tests of 12 species of Cambodian woods for pulp-making qualities indicate that the pine (pinus Merkusii) and two of the hardwoods (shorea cochinensis and hopea odorata) are highly satisfactory.

These facts were developed in a recent visit to the country by Grover A. Choate, forestry adviser of the U.S. Operations Mission in Phnom Penh. Detailed knowledge of Cambodia's timber resources is yet fragmentary, he reports.

A forest inventory, similar to that prepared under the Forest Survey of the United States, is presently being initiated. This project will be carried on by the Cambodian Forest Service with the technical assistance of a team of five U.S. forestry specialists furnished by the International Cooperation Administration.

There are as yet no operating paper mills in Cambodia, except for remote very small hand-made paper mills. A small mill with an estimated annual capacity of about 5000 tons is now under construction near Kratie on the Mekong River. This enterprise is being financed with foreign aid from the government of Republic of China. It has been estimated by a representative of a large U.S. paper company that the forests of Cambodia can support a 60-ton per day newsprint mill. A market for this production exists in Cambodia and neighboring countries of South East Asia.

Laos

Rich in valuable timber

Population: 2,600,000. Per capita paper consumption: 3.5 lbs.
Paper imports, 1,800 tons.
Imports from: Hong Kong and Thailand.

—Vientiane

The Kingdom of Laos is a paper importing country. There are no serious discussions of building pulp or paper mills, though there are extensive areas of bamboo and other woods.

The timber in the north, however, is highly valuable for special products and is being used for this purpose. There is considerable teak wood, for example.

Paper imports of various kinds come mainly from Hong Kong and Thailand. About half of the imports is newsprint.

Afghanistan

UN literacy campaign may help boost paper consumption

Population: 13,000,000. Per capita paper consumption, one-half a pound.
Imports from: U.S.A., India, Russia, Sweden.

—Kabul

An anti-literacy drive sponsored by the United Nations may be an influence to increase paper usage in this country of some 13,000,000 people.

There are no mills here and hardly any forests. Imports will be important for years to come although other new materials might be used for the purpose of making paper.

Most of the paper imports come from U.S.A., India, Russia and Sweden.

China

Takes giant steps toward a greater paper independence

Population: 640,000,000; per capita paper consumption: 4 lbs.
Machine-made paper mills: 24
Pulp mills: 13

Production (short tons)	1958	1959
Paper and board	1,259,000	1,630,000
Paper imports	181,500	195,000
Newsprint imports	11,500	12,300
Newsprint exports	47,500	51,000

Principal paper and pulp imports from: Russia, Finland, Sweden, Norway, Poland
Principal paper exports to: Ceylon, Burma, Indonesia

—Peiping

The strides made by the Chinese in the past few years must be looked on with awe in comparison to what has been done in other Communist countries, and yet by sheer weight of its magnitude, China has a long way to go.

Some 350,000 tons of its 1,630,000 tons of paper and board are handmade by oftimes primitive methods. It is still a long way from satisfying even the base needs of its people. And its per capita consumption of 4 lbs. per person is agonizingly low when one considers there are more than 600 million people in this rugged country.

Nonetheless, under its first five-year-plan, China boosted its paper and board production from a pitiful 594,000 tons in 1953 to 1,630,000 tons at present. Its aim is to increase production 20% a year for the next five years.

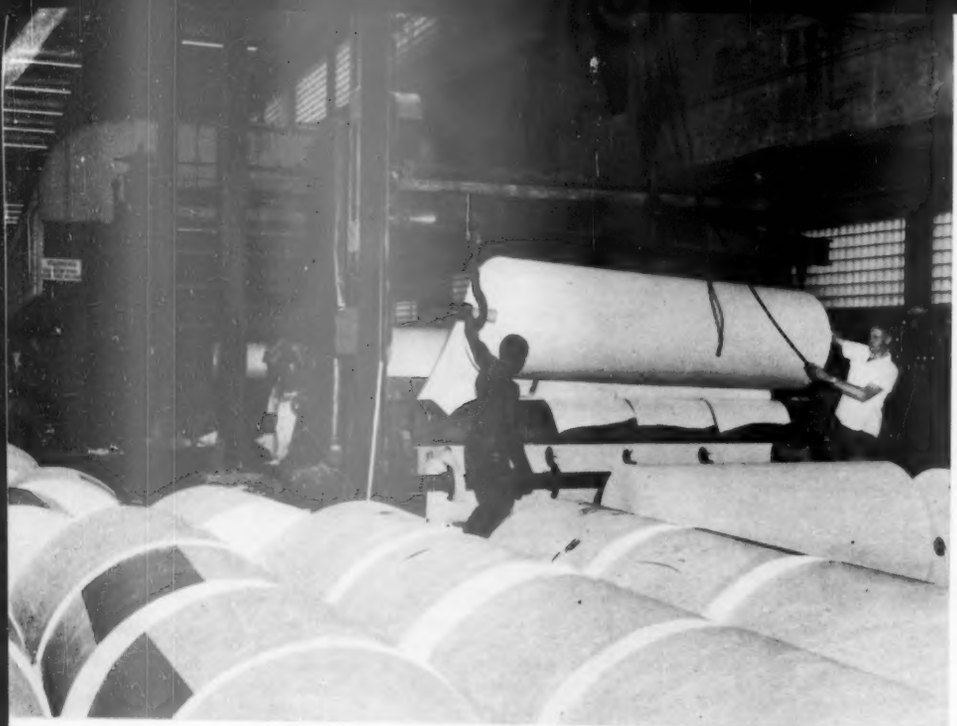
There are 24 large mills now operating in China and an infinite number of smaller ones. And these mills are producing 75% of their paper from non-fibrous materials: Wheat, rice and cotton. By 1962 they hope to be producing 162 different varieties of paper, 300 by 1970.

The three largest newsprint mills at Canton, Nanking and Kianuze produce 145,000 tons of which about 3,000 are exported to Southeast Asia. The largest is at Canton. It has five machines, three modern ones from Sweden and Finland, and produces 77,000 tons. The mill at Nanking is newer, started up in May, 1958, with a capacity of 100 tons a day and now produces close to 300 (55,000 tons a year). The mill at Kianuze is smaller, also produces a variety of other papers. It was built with Russian aid.

In Shanghai, 25 small paper mills are now making about 195,000 tons of various grades of paper a year. In 1959 their production was boosted through modernization and expansion some 20%, and another 15% increase is estimated for this year. A pulp mill is also under construction to reduce the city's dependence on pulp imports.

Under the current five-year-plan, production is supposed to increase to 2,750,000 tons, doubling the current output. This will call for an increase in the number of pulp mills from 13 to 39 and in the number of paper-producing mills from 16 to 70. The program also calls for extensive reforestation under the present "Make China green" program.

RICE, ANCIENT RAW MATERIAL of papermaking, is still used in many Far Eastern nations. (United Nations photo)



SLITTER-REWINDER at SAPPI'S Enstra mill, Springs, near Johannesburg. The Estra mill is scheduled for the production of newsprint in January 1961.

AFRICA

South Africa

Greater production absorbed by natural population growth

Population: 15,000,000; Per capita paper and paperboard consumption: 55 lbs.
Paper and paperboard mills: 10; Woodpulp mills: 2; Vegetable fiber pulp mills: 1

Production (short tons)	1958	1959
Paper and paperboard	150,000	202,570
Chemical woodpulp	75,000*	90,000*
Mechanical pulp	——	1,000
Bagasse pulp	20,000	20,000
Paper and paperboard imports	225,000	200,000
Woodpulp imports	22,000	15,000
Paper and paperboard exports	5,000	1,400
Woodpulp exports (Excluding rayon)*	—	—

Principal grades made: Kraft, paperboard book and writing
Principal exports of paper and paperboard: To other territories in So. Africa
Principal woodpulp exports to: Only rayon pulp to U.K. and Italy
Principal woodpulp imports from: Sweden, U.S.A., Norway
Principal paper and paperboard imports from: Canada, U.K., Norway, U.S.A., Sweden
*Excluding rayon
**Exports of rayon pulp are estimated at 62,000 tons a year
Note: The above statistics are supplied by the South African Dept. of Commerce & Industries

By TOM MACDONALD
Editor for Union of So. Africa

—Johannesburg

Greater production by the local mills tell a progress story of the South African paper industry for 1959. The higher output has been absorbed by the natural growth of the population, and per capita consumption at 50 lbs. remains the same as in 1958.

But at last, and oddly enough during the national crisis which has put South Africa in a state of emergency, the government has announced that it will back an ambitious immigration policy.

It is rather a curious state of affairs that a country should call for immigrants when the country has only recently faced a flood of disorders. Of course, the economic backbone of South Africa is healthy, but it is clear now that the economic position must be resolved on the lines of peace between the black and white races.

The Government seems more determined than ever to carry on with its apartheid policy. Six Bantustans "national homes for the Africans" have been established, but as yet a mere £1,000,000 has been spent for their development. They will need at least £100,000,000 over 10 years.

There are more than 3,000,000 Africans in the urban areas and it is from among them that the sinews of the paper industry—the labor—is largely obtained. All industry depends on that labor.

Industry Accepts Challenge

Commerce and industry have accepted the challenge of a new deal for these people—higher wages and better conditions. The crisis must be resolved on that basis. The background at the moment is still uncertain, but it is certain that industry will not see itself wrecked on the altar of any ephemeral ideology.

Higher output in 1959 was due to the use of auxiliary equipment. The mills have installed many new machines and they are poised for increased tonnage in output this year, and even more so next year. The technical developments will make for the production of a wider range of paper products.

The present unsettled conditions are bound to hit imports adversely, but there is much optimism expressed that the crisis will not last long. More immigrants and the growth of the population might easily keep imports on a steady keel.

In 1959 South African mills produced for the first time super bleached and polyethylene coated papers. One mill produced M.G. poster paper.

No newsprint is yet made but there is no change in the scheduled plans of the South African Pulp and Paper Industries, the biggest paper company here, to produce the first South African newsprint at the Enstra Mills, at Springs, near Johannesburg, in 1961. The Union imports 22,000 tons of newsprint a year. Initially Sappi will produce 22,000 tons a year.

Profits Rise

Indication of the new prosperity of the industry in South Africa is found in the 1959 financial report of Sappi. Net profit after tax for the year ended December 31, 1959, was £696,485 compared with £492,070 in 1958 and £487,000 in 1957.

The increased profit was largely due to bigger production from new plant installed as the result of the company's heavy capital expenditure program.

It is to the African that the paper industry must look for increased trade. A tremendous factor lies in the education of the African . . . and in education 90% of the material used is paper.

In 1958 about £2,000,000 was spent on African education in South Africa. It is now about £4,000,000 a year.

Report of New Enterprises Issued by Government

Pretoria . . . . In a report especially prepared for this Review Number, the Union of South Africa's Department of Commerce and Industries, says:

"During the past year (1959) one additional paper mill at Bellville, Cape Province, came into full operation. This mill is producing tissue.

"A new mill for the production of newsprint is being erected at Enstra, Transvaal, being an extension of an existing paper mill. It is expected that this mill will come into operation early in 1961 and is expected to produce roughly one third of the Union's requirements of newsprint, i.e. an estimated production of 22,000 tons per annum. The production will be increased as demand grows and the quality of the newsprint becomes established. Mechanical printing papers will also be produced in this plant.

"The same company (South African Pulp & Paper Industries Ltd.) has installed a new machine for making cardboard, and it is believed to be operating with very satisfactory results. At the Tugela, Natal, mill of the company a wide range of kraft papers is being coated with polyethylene film.

"With the object of improving the brightness of their white paper this company has decided to introduce chlorine dioxide bleaching and the necessary plant and equipment was installed during 1959.

"Other projects that are visualized are the following:

"(a) Establishment of another new paper mill to produce sulfite paper for fruit wrapping, from surplus timber.

"(b) Establishment in Swaziland of a mill to produce chemical pulp mainly for export."

Figures on woodpulp in the lead table to this article, released by the government to this magazine, do not include rayon woodpulp. The S. A. Development Corp. and Cortaulds factory at Unkomaas, Natal, export about 62,000 tons a year, valued at more than £3,000,000. Nearly all rayon pulp is shipped to Britain and Italy, with an odd shipment at times to the U.S.A.

The St. Regis Paper Co. (U.S.A.) made news the past year with its partnerships with paper converting and marketing companies and this activity by St. Regis is being extended elsewhere in Africa.

South African Pulp & Paper Industries Ltd., is now in partnership with Kimberly-Clark Corp., U.S.A., in Cellulose Products of Johannesburg, to make tissue and wadding. New installations are planned at this plant.

Congo Republic

New mills considered

Population: 13,559,000. Per capita paper consumption: 2.4 lbs.

(short tons)	1958	1959
Paper and paperboard imports	22,323	24,550
Paper and paperboard exports (converted)	221	221
Paperboard production	550	650
Pulp imports	98	100

Principal paper imports from: Belgium, France, Sweden, U.S.A.
Principal pulp imports from: U.S.A., U.S.S.R.

—Leopoldville

Major paper producer here is Cartonneries du Congo S.P.R.L. near Elizabethville, which produces some 13,200 tons a year. Its products are mainly corrugated containers. The country has no pulp mills and imports a minor amount of pulp for conversion purposes.

Under consideration is a giant hydroelectric plant on the Congo River. If this dam should be built, interests outside the Congo have indicated they will build a kraft paper bag mill using imported pulp at Mayumbe. This project would eventually be expanded to include a pulp mill.

Sudan

Cotton and papyrus considered for growing production

Population: 10,400,000. Per capita paper consumption: 1.3 lbs.
Paper and board imports (est.): 7100 short tons.

—Khartoum

In the Sudan the two outstanding possible raw materials for pulp are cotton stalks and papyrus. Cotton grown in the Kassala region has been studied closely by the government, and decision has been made to construct a plant at Aroma for production of paperboard at an annual rate of 4,000 tons. The mill is being designed and built by Yugoslav paper industry experts.

The Sudd region is prospectively a vast unexploited source of cellulose raw materials. In an area extending some 30 mi. south of Lake No to Shambi a dense growth of papyrus has been estimated at 150,000,000 tons; the yield per acre in this 5000 sq. mi. is said to range up to 40 tons. The quick-growth fiber gives possibility of three crops per year. It is in this area that the ruins of a paper mill built prior to World War I can still be seen.

As early as 1910 and up until outbreak of World War II numerous studies of papyrus as a papermaking raw material were made in Europe. The results were technically encouraging but were turned down primarily for economic reasons. Problems are largely ones of collection, transport and labor. It was determined that

MAN-MADE FORESTS IN SOUTH AFRICA are source of woodpulp. At left, rows of eucalyptus as fire-breaks between blocks of pine; at right, stand of Pinus Patula pines.

economics called for conversion to pulp on the spot for export.

Further study resulted recently in announcement by Two Niles Cellulose & Paper Mfg. Cos. that a mill will be built in the Lake No area for production of cellulose and all types of paper at an annual rate of 8600 tons. Operation is expected late this year.

In the converting field, Blue Nile Packing Co. Ltd. is producing corrugated containers, paperboard boxes and gummed kraft paper in reels at a plant in the Khartoum North Industrial area. Operation started in 1957. Early last year the firm opened a repulping plant using waste material for making brown paper and a wide range of board.

Cnt. Africa Fed.

Plans going ahead for developments in pulp and paper

Population: 8,100,000. Per capita paper and paperboard consumption: 7 lbs.
Paper and paperboard mills: 2; Woodpulp mills. None

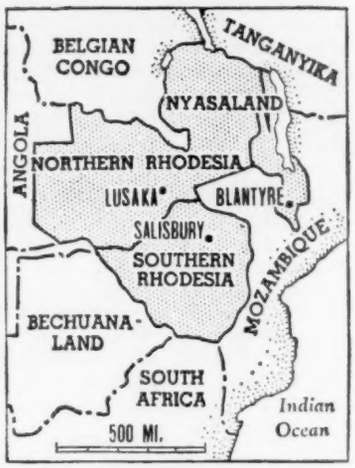
Production (short tons)	1958	1959
Paper and paperboard	7,000	7,500
Paper and paperboard imports	23,268	23,408
Woodpulp imports	840	929
Paper and paperboard exports	25	118

Principal paper grades made: Kraft papers and paperboard
Principal paper and paperboard exports to: Belgian Congo, Union of South Africa
Principal woodpulp imports from: Norway, Sweden, Canada
Principal paper and paperboard imports from: Canada, Union of South Africa, U.K.

Salisbury

The British-owned Board & Paper Mills at Umtali, Southern Rhodesia, 150 miles from Salisbury, announces that in the next two years it will build plant capable of supplying the Central African Federation's entire needs of newsprint, mechanical printings and similar papers. Newsprint imports, mostly from Canada, are now worth £365,000 a year.

There is another paper project planned. Rhodesian Cellulose is being aided by Snia Viscosa of Italy and others and the venture is being financed by the Federal Government. Snia Viscosa is at the moment experimenting with Rhodesian timber for newsprint.



POLITICAL TURMOIL here . . . but more new mills are planned. Central African Federation—the Rhodesias and Nyasaland—looks forward to supplying all its needs for newsprint and printing papers.

Recent Developments

The Department of Commerce and Industry makes this report, especially for this World Review:

"In recent months two developments of interest have taken place in the pulp and paper industry in the Federation.

"First, one of the established manufacturing industries has announced its intention of expanding its operations, and hopes to start production of newsprint.

"Second, the Rhodesian Cellulose Development Co. has revealed that they are moving into the planning stage for the establishment of a pulp and paper mill. The following is a verbatim extract from the press release published in the *Rhodesia Herald*.

" 'The Rhodesian Cellulose Development Co. announced in Salisbury that it has decided to proceed immediately with the second stage of the plan to build a pulp and paper mill at Odzi, 20 miles from Umtali, at a cost of more than £4 million. Partners in this company, which was formed 18 months ago, are the Imperial Tobacco Co.; Snia Viscosa, an Italian associate of Courtaulds of London; Cartiere Beniamino Donzelli, an Italian paper making company; and Phillip Hill, Higginson, Erlangers Ltd., the merchant bankers.

" 'The company will be assisted during the development stage by the federal and Southern Rhodesia governments.

" 'The company said yesterday that the second stage will entail a comprehensive study of both internal and possible export markets, detailed planning of the most suitable plant, for which the necessary specifications will be prepared, and the preparation of a comprehensive financial plant. The statement said that options had been negotiated on three possible sites. The wood used will all be waste wattle trees from which the bark has been stripped, or pine trees which are unsuitable for timber."

The Umtali mill now has a 100-in. machine making kraft grades. It also operates a groundwood mill and makes suitcase board.

Egypt

Two new mills are scheduled for early start-up

Population: 24,026,000; per capita paper consumption: 10 lbs.
Paper mills: 10
Straw or vegetable fibre mills: 1

Production (short tons)	1957	1958
Paper	23,000	44,000
Straw & other pulp	3,000	3,300
Paper imports	81,000	97,900
Paper exports	2,300	1,650
Woodpulp imports	10,000	19,800

Principal paper grades made: Kraft, sulfite, book and writing, paperboard
Principal paper imports from: Finland, Sweden, Japan
Principal woodpulp imports from: Scandinavia, Canada, Czechoslovakia
Principal paper exports to: Sudan, Saudi Arabia

—Cairo

Two new paper mills are scheduled for start-up shortly, one of them to produce 80 tons of pulp and paper a day from rice straw, reeds and imported woodpulp.

The pulp and paper mill, engineered by Stadler-Hurter International Ltd. of Montreal, Canada, is owned by a West German group, Société Générale de l'Industrie du Papier, "Rakta." Mill will cost an estimated £E 4 million.

A second mill built by the Egyptian Kraft Co., founded in 1957, is also slated to begin production in the near future. It will produce all types of paper on a single Fourdrinier machine with a second to be added as demand increases.

Two other new mills are also under consideration, one to be backed by the Egyptian government. It will be financed by the Egyptian Industrial Bank, the Social Insurance Fund and other public firms. It has been reported that some equipment will be purchased from Eastern bloc countries. Yugoslavian equipment manufacturers have also been discussing a paperboard factory utilizing cotton

stalks to be built in Aroma in the Gash Delta.

Egypt uses some 121,000 tons of paper and board a year, of which 35,000 tons are writing and printing papers; 15,000 tons are newsprint; 40,000 tons are wrapping, and 20,000 tons are paperboard. About 40% of the needs of the country are presently produced domestically.

Liberia

Resource development slow

Population: 1,105,000. Per capita paper and paperboard consumption: ½ lb.

	1958	1959
	(short tons)	
Paper and paperboard imports	359	306
Woodpulp imports	1	—

Principal paper and paperboard imports: from: U.S.A., Sweden, West Germany

—Monrovia

This independent Negro republic on the southwestern Africa coast has great untapped resources but its development has been understandably slow. Its chief products are fiber, palm kernels, crude rubber, rice, coffee, cocoa and sugar. Its most potential product: Timber.

On loan to the United Nations, E. W. Fobes of the U.S. Forest Products Laboratory in Madison, Wis., completed a survey last year showing the vast possibilities of this region. Its 9 million forest acres have a potential yield of some 2 billion bd. ft. per year from virgin timber estimated at 140 billion bd. ft. Among its 250 species are many suitable for pulping.

Tunisia

Final studies underway for esparto grass mill

Population: 3,815,000; per capita paper consumption: 5 lbs.
Pulp mills: 2 (including 1 under construction).

—Kasserine

Final approval of plans for an $11 million pulp and paper mill—the first large scale mill in North Africa—is expected shortly. A team of engineers is now in the U.S. studying Pandia digester equipment in action before putting the final stamp on the project.

A $6,250,000 loan has already been approved by the Development Loan Fund and the Tunisian government has only to approve the equipment for the project to be in the ground-breaking stage. This is basically a formality involving inspection of proposed equipment operating in the field.

The Société Nationale Tunisiene de Cellulose mill will be built by Parsons & Whittemore/Lyddon and will produce 88 tons a day of bleached esparto pulp. It is located here in Kasserine, well-known as a World War II battlefield.

The mill is expected to increase the country's export receipts substantially. Esparto grass has been a leading export item and is considered a valuable raw material in France and Scotland for making high quality paper. By making the pulp in Tunisia a weight saving of 60% and volume saving of 25% will be realized. Black-Clawson International Ltd. will supply the Fourdrinier machine.

Ghana

Plans developing for mill

Population: 4,836,000. Per capita paper consumption: 6 lbs.
Paper mills: 1
Paper production: 300 tons
Imports: 2,982 tons
Principal paper imports from: U.K., Finland

—Accra

Only three years old, Ghana is anxious to develop its vast forest resources. More than half its 91,843 square miles are forested, although 30% of this is inaccessible. Hardwoods abound in this area and 11% of Ghana's exports are in lumber, much of it mahogany.

In collaboration with the Colonial Products Advisory Bureau in London, successful tests have been made of the suitability of manufacturing pulp and paper from certain of Ghana's aging results, the Ghana Industrial wood species. Based on these encour- Development Corp. at Accra has decided to set up a paper mill in western Ghana. This will be Ghana's first pulp and paper mill and as yet details concerning it are vague.

Meanwhile, Ghana this year shifted its import agreements considerably. Imports of paper from the United Kingdom dropped from 1162 short tons in 1958 to 487 tons, while imports from Finland increased from 720 tons in 1958 to more than 1200 tons in 1959. Imports from West Germany were also doubled.

Port. Africa

New mill under construction

Population: 11,404,000. Per capita paper and paperboard consumption: 2.5 lbs.

—Luanda

The first pulp and paper mill in Portugal's overseas provinces was under construction early in 1960 in the high tablelands of Benguela, Portuguese West Africa. Production is expected by the end of the year.

The plant will satisfy the needs of the Angolan market in both wrapping paper and large-capacity paper bags. Surplus production will be exported to neighboring countries.

Portuguese Africa includes Angola, the Cape Verde Islands, Mozambique, Portuguese Guinea and the islands of Sao Tome and Principe. Overall area is 794,959 sq. miles. Largest are Angola (481,351 sq. miles) and Mozambique (297,731 sq. miles).

According to early reports, the mill is being built by Cia. de Cellulose do Ultramar at Alto Catumbela, Angola. Initial capacity is to be 16,500 tons woodpulp, 3,300 tons pulp from agricultural and industrial residues and 8,000 tons paper (including kraft).

LOGS ARE DEBARKED BY HAND AXE at African Timber and Plywood (Gold Coast) Ltd.'s woods operation near Samreboi, Ghana, 100 mi. inland from Takoradi.

French West Africa

New bleached paper mill is planned at Bimbresso

Population: 18,747,000; per capita paper consumption: 1.5 lbs.

	1957	1958
Paper and board imports (short tons)	15,950	17,495
Paper and board exports	100	110

Principal paper imports from: France, Sweden, Morocco
Principal paper exports to: France: Republic of the Congo

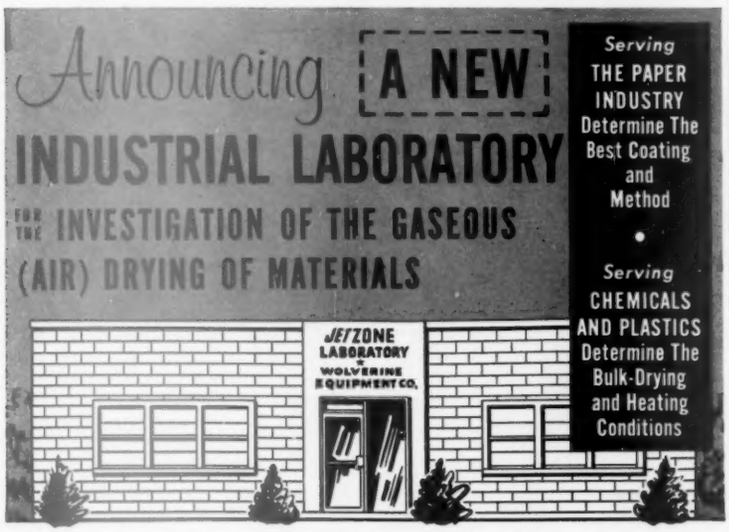
—Dakar

Plans have been announced for construction of a new pulp and paper mill at Bimbresso to be built by Bimbresso Cellulose Gruendungsgesellshaft, Zurich, Switzerland, and the government of the Ivory Coast.

Plans call for production of 36,000 tons a year of bleached pulp and paper with eventual capacity to reach 100,000 tons.

Ivory Coast will hold 36.5% of the capital which will total 822 million francs.

The pilot plant established by Regie Industrielle Cellulose Coloniale at Bimbresso was dissolved last year.



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Purpose: Drying, heating, cooling of particles of material.

Preceded by: Feeder or pelletizer.

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Libya

Potential mill capacity is more than 4,000 metric tons

Population: 1,150,000. Per capita paper and paperboard consumption: 5 lbs.

Production (short tons)	1959
Wrapping, paper bags	2,200
Paper and paperboard imports (1958)	675
Esparto grass exports (1958)	22,506

Principal paper imports from: Italy, United Kingdom, Germany
Principal esparto grass exports to: United Kingdom

—Tripoli

One paper mill—located in the capital city—had a 1959 output of about 2,000 metric tons. Potential capacity is 11 metric tons per day. Production includes wrapping paper and bags from domestic raw materials.

Although the country exports neither paper nor pulp and imports no pulp, Libya is an important exporter of esparto grass. This grass grows over wide areas of Tripolitania and is collected, pressed into bales and shipped to paper mills in the United Kingdom for the manufacture of banknotes and fine papers. Exports of esparto grass in 1958 (the latest year for which statistics are available) totaled 20,460 metric tons.

Ethiopia

Has two small mills

Population: 19,500,000. Per capita paper consumption: 0.5 lbs.
Paper mills: 2
Paper production: 220 short tons
Paperboard production: 17 short tons
Paper and board imports: 1,320 short tons
Principal paper imports from: Italy, United Kingdom, Sweden

—Addis Ababa

With an almost negligible paper consumption of less than one pound per capita, it appears unlikely that the government will show any great interest in developing the paper industry here.

There is, however, an outside chance that industrial developers may take an interest in Ethiopia. The International Bank is currently conducting a survey of hydroelectric power and several American firms have founded industrial plants here. Highways are being improved, the country has a good radio and telegraph system and a modern airlines serves the nation. There are eight rivers and water for industrial uses is abundant.

Two small paper mills currently produce about 220 tons of wallpaper a year and 17 tons of paperboard.

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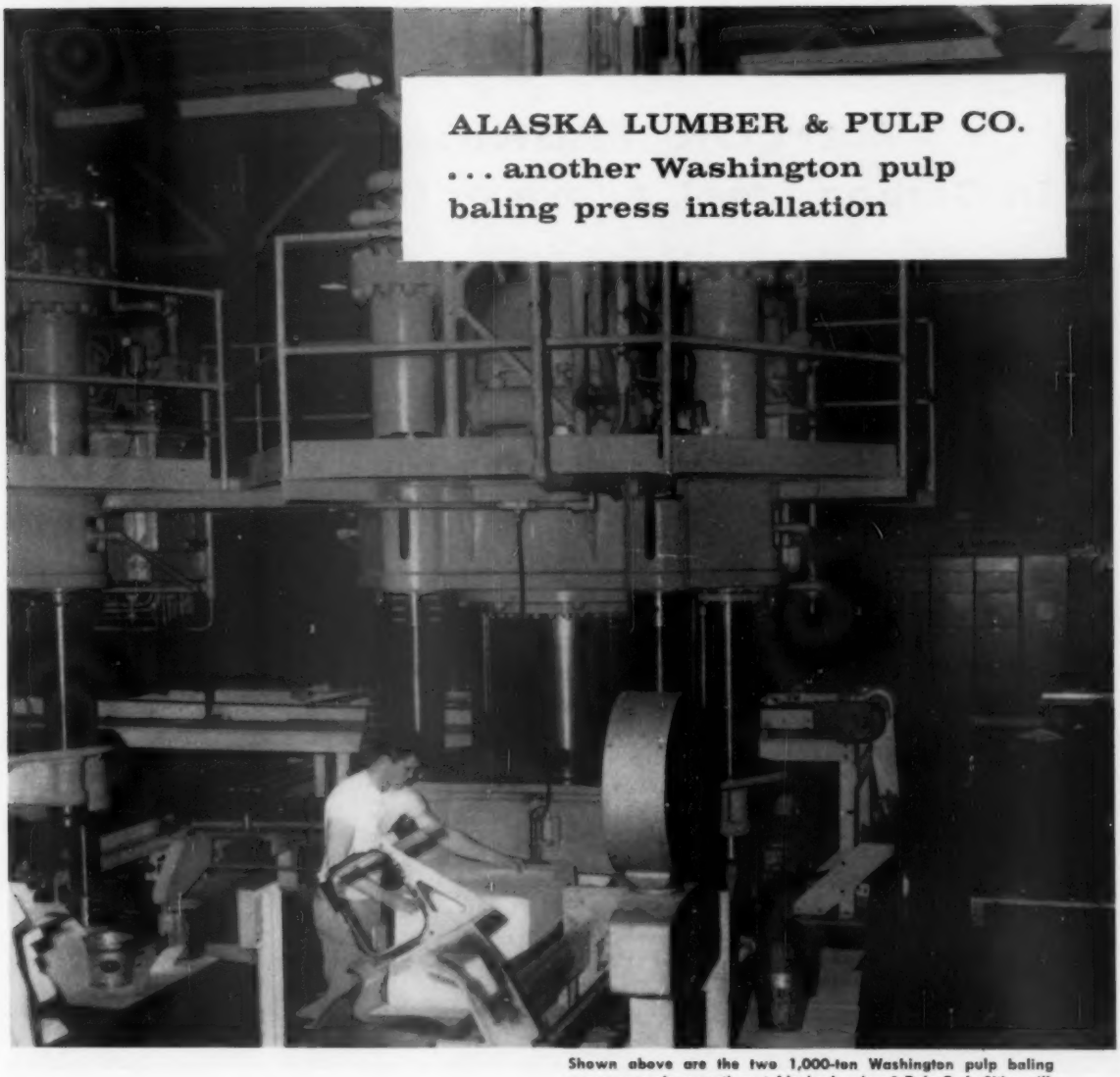

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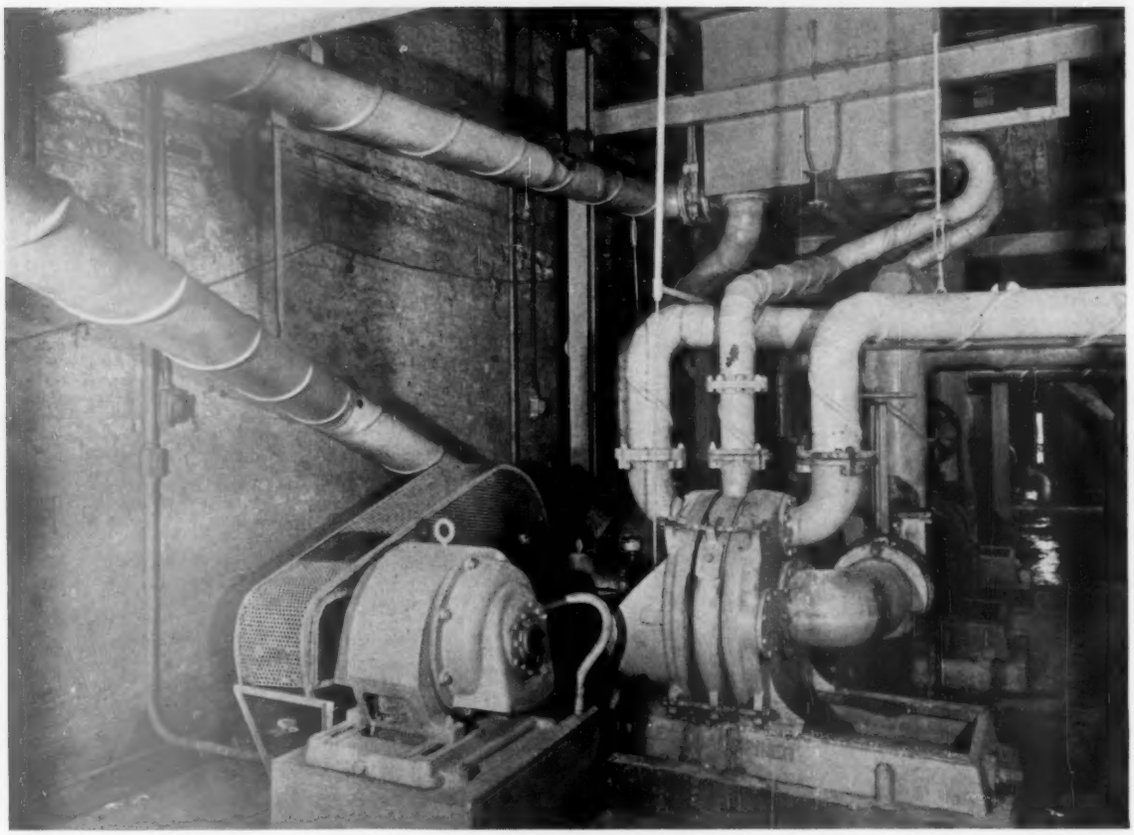

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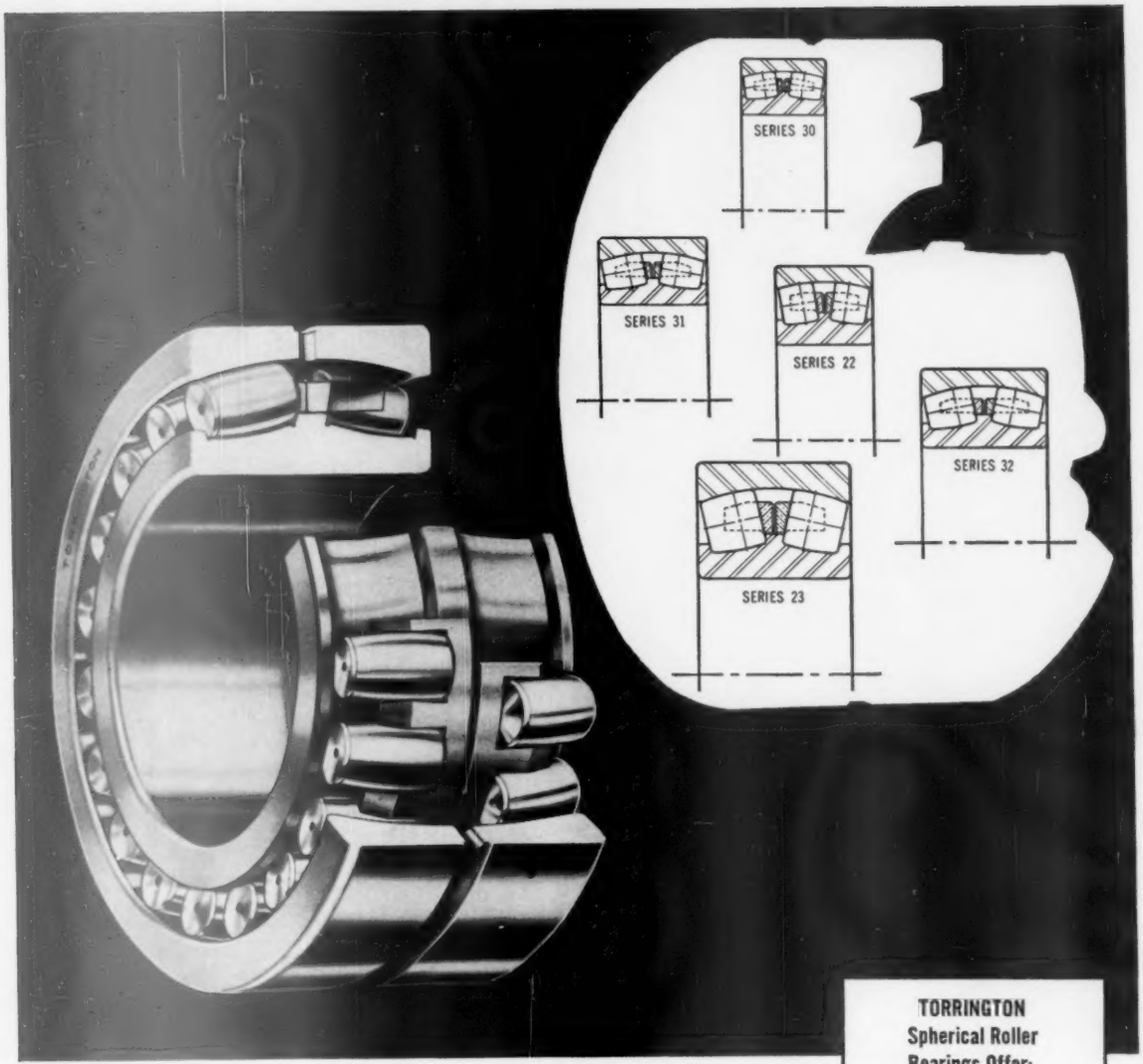

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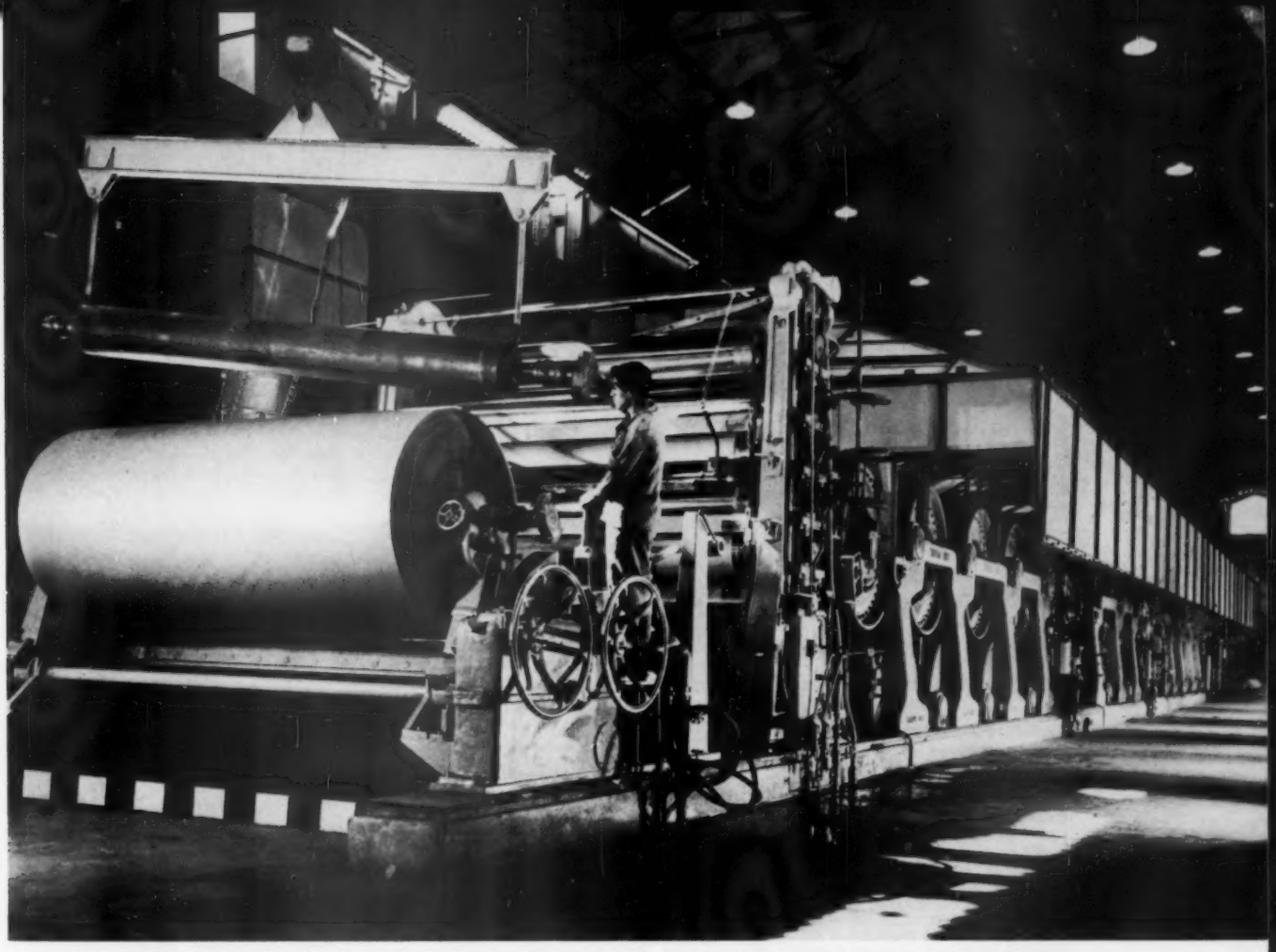

INSATIABLE PAPER DEMAND stimulates production on modern machines throughout Latin America

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LATIN AMERICA

Argentina

Economic transformation holds promise of industrial expansion

Population: 20,255,700. Per capita paper and board consumption: 49 lbs.
Paper and/or paperboard mills: 79. Woodpulp mills: 6. Straw or vegetable fiber pulp mills: 1
Pulp mills: 1

Production (short tons)	1958	1959
Paper and paperboard	361,090	380,930
Chemical woodpulp	66,000	76,560
Mechanical woodpulp	36,000	18,370
Paper and paperboard imports	170,500	143,000
Woodpulp imports	176,000	193,600

Principal grades: all major paper grades.
Principal paper and paperboard imports from United States, Finland, Norway, Sweden.
Principal woodpulp imports from: United States, Canada, Sweden

By JULIO CÉSAR LERA
Editor for Argentina

—Buenos Aires

Argentina is undergoing extraordinary transformation from a state-directed political economy to free enterprise. Financial and political problems spawned over the past 20 years are being resolved by the government of the constitutional president, Dr. Arturo Frondizi. Industry—as one of the principal beneficiaries—is experiencing growth unforeseen just a few short months ago.

First of the nation's problems to find solution was run-away inflation, which has now been stemmed by stabilization of the peso. Increased supplies of gasoline, natural gas and electric power have furthered industrial revitalization. Taxation is being reorganized and government bureaucracy cut to absolute minimum. Government deficit is a prime target of the still-young administration.

Industrial Climate Good

Outlook for paper and paperboard expansion is extremely good. Per capita consumption is expected to record phenomenal growth in the next five years—to a level consistent with the nation's true standard of living.

Capital expansion in the industry is encouraged. Two new paper and paperboard mills costing more than $2,500,000 have been approved and will be built on the Parana Delta.

Industrial optimism foresees unprecedented expansion this year and in the years to come. This outlook is based not only on currency stabilization, but also on the vote of confidence given the government's social-economic program March 27.

Presently, the government is creating the necessary climate for industrial modernization and expansion. At the same time, every effort is being made to create a nation independent of the rest of the world for its basic needs.

In June 1959 Dr. Frondizi called upon his former political opponent, Engineer Alvaro C. Alsogaray to collaborate as a member of the executive power in his government and commissioned him with the task of organizing an economic-social program.

Resulting from this important decision, the country has benefited from the most capable and intelligent team leaders that have existed these last 20 years. This will enable the Argentine nation to resolve her financial and economic problems in a short time.

The first beneficial results of the economic program called the "Big Plan" by Engineer Alsogaray, are already to be seen. The economic team has been able to stop the inflation started arbitrarily and irresponsibly by ex-dictator Peron's regime and continued by governments that succeeded his.

Two Big Projects

The outlook for the investments of capital for the fabrication of paper and paperboard is very encouraging. Under Peron's regime, paper consumption per capita was maintained at a much lower level than it should have been.

Two foreign capital projects have already been organized, involving a sum of $2,583,000 for the manufacture of paper and paperboard. The mills will be installed in the Paraná's Delta. These were approved before December 31, 1959.

JULIO CÉSAR LERA, vice president of Francisco Lera S.A. Financiera y Comercial, Buenos Aires, is also this magazine's editor for Argentina. He is familiar with pulp and paper activities in his country. He represents newsprint producers of several countries in the Argentine market. In 1950 he worked with Argentine's Finance Minister on plans for a newsprint mill using bagasse but this was abandoned when Peron ordered economy measures.

I am optimistic respecting the paper industry outlook for this and the following year. This optimism is based on the fact that, apart from the stabilization of the Argentine currency, the government has achieved a vote of confidence in favor of the social-economic program in the elections of March 1960. These elections prove that the Argentine citizen is growing mature in his civic function. For this reason this government is also very near reaching political stability, and this guarantees the supremacy of the law and, of the constitutional order, increasing in this way the investors' confidence in our country.

Projects in Argentina

New pulp and paper mill projects are planned in Argentina:

A new bisulfate pulp mill is to be built in the delta of Argentina's Paraná river by an Argentinian. The

West German firm. Heinrich Meier & Co., GmbH., of Wiesbaden will build the plant with Messrs. Potsoi S.A., Com. Ind. Fin. & I., of Buenos Aires.

Based on a credit of $700 thousand from the Export-Import Bank, Cia. General Papelera S.A., Buenos Aires, will build a mill in the capital to make illustrating, offset and similar papers. Production is expected to start in December. Associated in the venture is the S.D. Warren Co., a leading American paper manufacturing firm of Boston, Mass., and the paper machine will be by Beloit Iron Works.

Papelera Argentina SA and Compania General Papelera de Buenos Aires SA have been extended credits totaling $2,220,000 by the Export-Import Bank.

An Argentine group is reported interested in building a paper and corrugated cardboard factory in the town of Tres Arroyos, Province of Buenos Aires, capitalized at 10 million Argentine pesos.

An association of pulpwood producers in the delta of the Paraná is looking for outside capital to participate in a woodpulp mill on a suitable site in the delta. The Province of Entre Rios is apparently prepared to supply 50% of the capital.

It is reported that Messrs. Ledesma S.A. Agricola Industrial propose to invest $11 million plus 540 million pesos for a new mill in the Province of Jujuy to make cellulose and paper. This mill will have a total production of 100 metric tons of white writing and printing paper a day. Sugar cane bagasse, kenaf fibers, ramie, agave fiber and hemp will be used with a continuous Pandia pulp digester.

IMPORTANT FIGURE IN ARGENTINA. Engineer Alvaro Carlos Alsagaray, economic minister and provisional labor and social security minister. Our editor in Argentina says he will have important influence on the future of pulp and paper in that country and describes him as an "outstanding politician, a strong supporter of free enterprise, and a man who had great success in developing, while in private life, a highly efficient oil industry at low operating costs."

ARGENTINA—PAPER AND BOARD

(in short tons)

	Imports	*Production*	*Total*
1949	240,836	195,565	436,401
1950	211,949	232,548	444,497
1952	178,509	220,006	398,515
1953	37,025	191,925	228,950
1954	70,770	251,511	322,281
1955	135,587	305,538	441,125
1956	123,321	289,332	412,653
1957	165,000	297,000	462,000
1958	170,500	361,000	531,500
1959	143,000	380,930	523,930

ARGENTINA—WOODPULP

(in short tons)

	Imports	*Production*	*Total*
1949	76,519	38,191	114,710
1951	141,622	45,295	186,917
1952	94,979	41,628	136,607
1953	39,173	43,390	82,563
1954	186,797	58,230	245,028
1955	222,588	88,000	310,588
1956	143,695	88,000	231,695
1957	152,700	90,000	242,700
1958	176,000	102,000	278,000
1959	123,970	94,930	218,900

ARGENTINA—NEWSPRINT IMPORTS

(in short tons)

1949	112,012
1950	104,621
1951	117,082
1952	95,484
1953	30,776
1954	54,241
1955	92,030
1956	98,555
1957	132,898
1958	162,950
1959	138,600

Brazil

Competition in world markets aim of a growing industry

Population: 63,101,627. Per capita paper and paperboard consumption: 29 lbs. (est.)
Paper, paperboard and pulp (including straw) mills: 65

Production	1958	1959
	(short tons)	
Paper and paperboard	458,000	429,990
Newsprint	41,000	63,800
Chemical woodpulp	156,000	172,000*
Mechanical or groundwood pulp	110,000	121,000*
Paper and paperboard imports	181,500	199,650*
Newsprint imports	148,000	163,000*
Paper and paperboard exports	101	111*
Woodpulp imports	132,700	145,970*

*Estimated

Principal paper grades made: Wrapping, newsprint, book and writing
Principal paper and paperboard exports to: Paraguay, Uruguay
Principal paper and paperboard imports from: Sweden, Finland, Canada
Principal woodpulp imports from: Sweden, Norway

—Brasilia

Substantial production increases are expected in 1960. Newsprint is likely to jump from 63,800 to 89,100 tons; other paper and board from 429,990 to 471,900.

The paper industry has developed rapidly to meet the needs of the internal market of this nation that has grown economically at an almost unbelievable rate.

In past years the industry was handicapped by its inability to compete on the home market with the high quality and comparatively low prices of foreign products. It lacked in know-how, capital, equipment and cheap raw materials.

Especially since World War II, however, modern production methods and technical knowledge have been introduced, and a paper industry that produces many kinds and grades is now flourishing.

Imports Still Vital

While production has increased at a rapid pace, domestic demands have risen even faster. Thus, at present, production in certain grades is not sufficient, and imports continue to grow.

Future outlook is bright. Demand in all grades is increasing steadily and is expected to continue so for decades. New paper mills are in planning stage. Domestic and foreign capital are joining forces simply because the domestic market promises to be even better in the years to come. This, together with Brazil's favorable investment laws, seems to assure that the industry will soon catch up with economic growth.

$4,000,000 Invested

Four New York City organizations have invested $4,000,000 in Champion Cellulose S.A., a Brazilian corporation formed to finance construction and operation of a bleached sulfate woodpulp mill at Mogi Guacu. Production was expected sometime in 1960.

Interested firms include: International Finance Corp., Deltec Corp., Chemical International Finance Ltd. (affiliate of the Chemical Corn Exchange Bank of New York) and Bankers International Corp. (affiliate of Bankers Trust Co. of New York).

Champion Paper & Fibre Co. of Hamilton, Ohio, U.S.A., controls the Brazilian firm, will operate the mill and furnish management personnel.

Daily pulp capacity is to be 145 short tons, and to support this output forest plantations were being acquired and developed early in 1960. Pulpwood will consist primarily of eucalyptus, and the pulp produced will be sold to Brazilian papermakers for use

LATIN AMERICA

principally in production of printing and writing grades.

Growth on all Fronts

International Paper Co. (U.S.A.) has taken over W. R. Grace & Co.'s interest in a proposed eucalyptus kraft mill at Americana, São Paulo, in partnership with the Paulista Railroad (Cia. Paulista de Estrada de Ferro). Under the agreement, International will have an 88% stock interest and Cia Paulista the remaining 12%. The latter firm owns a large tract of eucalyptus in the immediate region.

An order has been placed with Kamyr AB, Karlstad, Sweden, for bleaching equipment for a continuous sulfite plant at the mill of Cellulose Cambará of Brazil. Eventual daily production will be 75 short tons. . . . Cia. Industrial de Papel Pirahy will install a fine paper machine at its Santanesia mill. Unit is to have a wire width of just over 120 in. and is being built largely in Brazil by Mecanica Pesada SA under license from Escher Wyss GmbH (West Germany).

Development at Valinhos

Rigesa S. A., subsidiary of West Virginia Pulp and Paper Co. (U.S.A.), embarked on an extensive development program for the Valinhos mill, State of São Paulo. Scheduled for installation is No. 2 paper machine, ordered from Cia. Federal de Fundição, a licensee of Black-Clawson Co. (U.S.A.). Fourdrinier will produce 55 short tons daily of kraft board and corrugated medium. Installation will bring daily mill capacity to nearly 110 tons.

Two Brazilian projects are being supplied by Metex, Finnish export organization that is also furnishing the experts who will assist in start-up.

Industria de Papel Leon Feffer S. A. is building a sulfate pulp mill at São Paulo and installing a fine paper machine with trim width of 3,600 mm. (142 in.) and speed of 400 m. (1,312 ft.) per min. . . . At the same time, Metex is also delivering to Industrias Klabin de Parana de Cellulose S.A. principal units for sulfate and groundwood pulp mills and for modernization of a newsprint machine (headbox, wire, press parts).

Lutcher S/A Cellulose e Papel was organized in September 1959 to construct a chemical pulp mill at Guarapuava, State of Parana. Investment is expected to total some $5,400,000 and operation set for early in 1963. Initial production of chemical pulp is placed at 49,500 short tons with eventual expansion to 73,700. . . . And Cicero Prado will build a 60-ton pulp mill to utilize eucalyptus. Equipment will be manufactured in Brazil by Bardella SA under license from J. M. Voith GmbH, West Germany.

Mexico

Consumption again is rising, four more new mills

Population: 32,000,000. Per capita paper and paperboard consumption: 31 lbs.
Paper and paperboard mills: 38; Woodpulp mills: 9; Vegetable fiber pulp mills: 4

Production (short tons)	1958	1959
Paper and paperboard	400,000	420,000
Chemical woodpulp	154,000	156,000
Mechanical pulp	36,000	36,000
Vegetable fiber pulp	30,000	33,000
Total pulp	220,000	225,000
Paper and paperboard imports	80,000	76,000
Woodpulp imports	27,000	28,000

Principal paper grades made: Newsprint, kraft papers, sulfite papers, book and writing papers, paperboard, tissues, cigaret and fine papers
Principal woodpulp imports from: U.S.A., Canada, Sweden, Finland
Principal paper and paperboard imports from: U.S.A., Canada, Finland

By CARLOS GARCIA ROBLES
Edi' for Mexico

—Mexico, D.F.

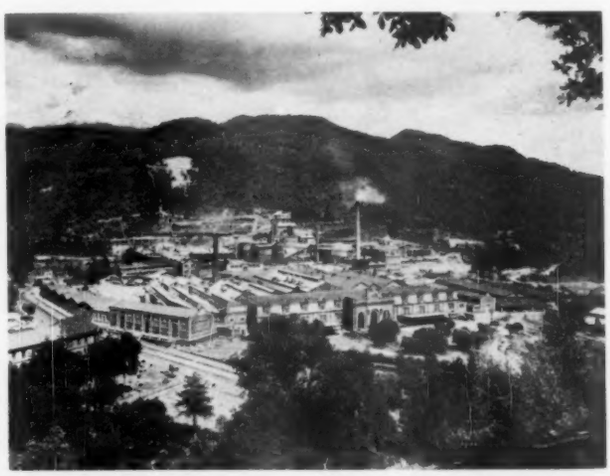
Production and consumption in Mexico during 1959 was at a higher level than in 1958. But the rate of increase was not as spectacular as in years past. With the new mills and several machines which have started operations since 1958, increasing the total production of paper and paperboard, there has been a slight decrease in activities in several lines, due, in the opinion of many papermakers, to some over-capacity and over-production. Therefore, there has been a slight decline in purchasing of new equipment, in spite of a decided general improvement in other types of industries.

Naturally, this slight setback is temporary only and a turn to the better is already being felt since the beginning of the current year when the consumption curve is expected to meet again and rise above the production curve. It now seems assured that new records will be set in 1960.

The two big events of the year past were the official opening of San Cristobal's bagasse pulp mill in January 1959 (this mill uses the Cusi pulping process, and a new Beloit tissue paper machine was installed) and the official starting of San Rafael's No. 11 machine, built by Dorries of Düren, West Germany. A new Eck supercalender and Jagenberg cutter were also installed at San Rafael. This mill, south of Mexico City, is the largest in the country.

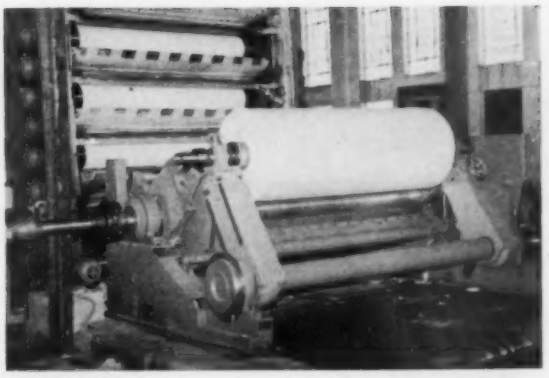
Kimberly-Clark de Mexico S.A. de C.V.

This is the new name of the company known before as "La Aurora S.A. de C.V."; James H. Simpson returned to U.S.A. being replaced as general



SAN RAFAEL MILL of Cia. de las Fabricas de Papel de San Rafael y Anexas S.A., under Mexico's famous snow-capped peaks of Popocatapetl and Ixtaccihuatl, is Mexico's biggest pulp and paper plant, with 11 machines making a wide variety of papers.

AT PAPELERA EL FENIX (left to right): Octavio Lara Poirée, production manager; Carlos García Robles, who represents Bruderhaus in Mexico; and Karl Sigler, Bruderhaus erecting engineer.



NEW EQUIPMENT at Papelera el Fenix in Mexico City includes this Pope type reel, built by Bruderhaus GmbH of West Germany, who also supplied new 3-pass flow spreader stock inlet.

manager by John Boyle. The old mill at Fernando de Alba Ixtlixochitl and the plant at San Bartolo Naucalpan are both continuing successful operations, both in and near Mexico City. Kimberly-Clark (U.S.A.) is the owner of the Aurora mills, which it has expanded.

Cartonajes Estrella S.A.

Engineering on No. 2 machine has been completed and already a Black-Clawson new wet end is installed. Installation work on the rest of the machine is under way and operations will start in the second half of this year.

Empaques Modernos San Pablo S.A.

The civil engineering work on this new mill is almost finished and mechanical installation is well under way.

Cia. Papelera el Fenix S.A.

Ricardo Gómez retired from his activities and was replaced by Alfonso Danel who is the present general manager. Under his leadership and with Octavio Lara Poireé as production manager, a considerable improvement in equipment and operations have been effected. A new Eck 8 cylinder machine calender has been installed. Also a Bruderhaus (Reutlingen, Württ., West Germany) three-pass flow spreader stock inlet and Bruderhaus Pope type reel have been added. The old beaters have been replaced with a Morden Stock-Maker and a Jones Fibremaster. The production during 1959 increased 1100 tons over the production the year before and the Fenix mill recently set a new all-time record production of 627 short tons in one month.

Fabrica de Papel "Mexico" S.A.

This entirely new mill started operations in July 1959 at the new site adjacent to Coyoacan's subsidiary El Pilar bagasse pulp mill. The 134 inch wide (wire) Fourdrinier machine is equipped with three Fibrella pulpers, five Jones No. 1 refiners and two Jones Fibremasters. The machine is driven by a Sandy Hill mechanical drive and it is equipped with a Ross Midwest Fulton drainage system, a J. O. Ross-Grewin and bottom felt air system. The moisture at the dry end of the machine is being controlled by a Hurletron moisture control. The stock is being cleaned and freed of entrained air by a two primary Vorvac and a secondary Vorject. A Jagenberg cutter has been installed in the finishing room.

Fabricas de Papel Tuxtepec S.A. de C.V.

This is Mexico's new and only newsprint mill. It has normalized its operations during the second half of 1959 when the electrical power was connected from the Temascal power plant. Its production during 1959 reached about 18,000 short tons, a fourth of which was special type paper for school books needed by the Mexican Board of Education and the rest was newsprint. Its machine was built by Black-Clawson Co.

Cartonera Sago S.A.

This entirely new mill, located at Atizapan de Zaragoza, state of Mexico (birth place of the present president of Mexico), was completed and operations started after the Holy Week 1960.

Santa Clara S.A.

Also an entirely new paper mill, at Santa Clara, state of Mexico, started operations in June 1959, with a 90 inch wire Fourdrinier machine, producing corrugating medium and cement kraft bags.

The mills in Monterrey are as usual

MEXICO—PAPER CONSUMED

(in thousands of short tons)

	Printing* (no news)	Writing & Fine	Coarse & Wrap	Tissue	Paper Board	Total (Includes others)
1948	20	23	59	7	47	165
1949	19	27	60	8	49	171
1950	25	32	75	12	54	209
1951	29	36	78	16	57	226
1952	29	33	76	15	63	230
1953	30	35	79	18	68	250
1954	28	38	80	22	71	260
1955	32	45	106	22	92	338
1956	48	64	131	22	97	415
1957	56	55	153	12	91	453
1958	58	61	168	13	100	480
1959	60	66	163	13	104	496

* Mexico imported 36,971 tons of newsprint in 1955; 51,557 tons in 1956; and 8,500 in 1957.

MEXICO—PAPER PRODUCED

(in thousands of short tons)

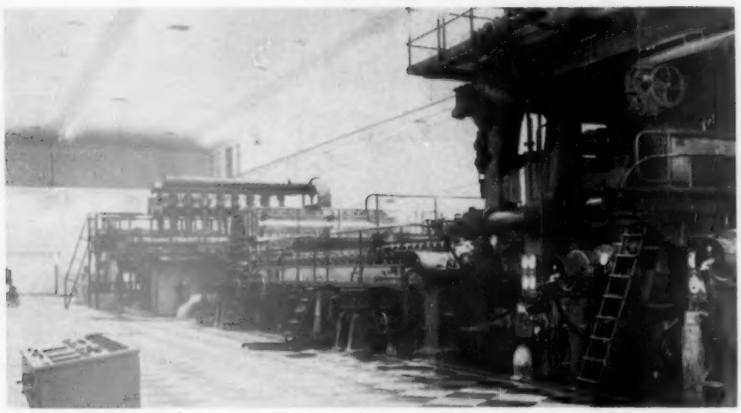
	Printing* (no news)	Writing & Fine	Coarse & Wrap	Tissue	Paper Board	Total (Includes others)
1948	17	20	54	4	44	147
1949	18	23	58	5	49	156
1950	22	25	52	4	45	150
1951	27	35	77	13	56	217
1952	25	30	70	2	60	198
1953	26	31	75	0	63	201
1954	23	33	78	2	67	207
1955	31	43	105	3	90	274
1956	46	61	130	4	96	346
1957	54	52	152	12	86	357
1958	56	59	164	13	97	400
1959	58	64	162	13	102	420

* There was no newsprint made in Mexico until 1958 (see story).

MEXICO—WOODPULP

(in short tons)

	Produced	Imported
1937	18,636	
1946	27,010	
1947	56,314	
1948	78,880	32,933
1949	71,500	15,000
1950	77,000	56,500
1951	94,000	56,000
1952	90,000	60,000
1953	92,000	54,000
1954	96,000	44,000
1955	148,000	46,000
1956	174,000	30,000
1957	218,000	25,000
1958	220,000	27,000
1959	225,000	28,000



LARGE NEWSPRINT MACHINE in South America is this Voith unit in paper mill of Compania Manufacturera de Papeles y Cartones, Chile. Wire width is 200-in. (500 cm) and speeds up to 2000 ft (609.6 cm) per min.

very busy. Empaques de Carton "Titan" S.A. has started its third Sandy Hill machine.

Wangner Builds Wire Works

There are also more interesting developments in manufacturing of equipment in Mexico for paper-making. Wangner de México S.A., subsidiary of the firm Hermann Wangner of Reutlingen, W. Germany, is manufacturing Fourdrinier and cylinder mold wires. It has already manufactured its first wire for Negociación Papelera Mexicana S.A., a Mexico City paper mill, Wangner's first client in this country.

Venezuela

Venepal mills to spend $1.5 million on pulp mill

Population: 6,320,000; per capita paper consumption: 13 lbs.
Paper mills: 5

Production (short tons)	1957	1958
Paper production	15,000	16,250
Paper imports	25,000	25,380
Pulp imports	13,000	14,125

Principal paper grades made: Kraft, sulfite, book and writing, paperboard, tissues
Principal paper imports from: Canada, U.S., Finland
Principal pulp imports from: Sweden, U.S., Canada

—Caracas

C.A. Venezelona de Pulpa y Papel —Venepal for short—the newest mill in Venezuela near Moron, which just started production last year, has been granted an Export-Import bank loan of $1.5 million. The three-and-a-half year note will enable it to complete its pulp mill.

Machinery and engineering services from the U.S.A. will be used. The mill produces 40,000 tons of kraft corrugating a month and is the country's largest. Engineering will be carried out by Process Evaluation Technical Services Corp., a subsidiary of W. R. Grace and Co. When completed, the mill will represent a $5 million investment by the bank.

Venezuela is now the largest customer for U.S. goods in South America, last year spending more than a billion dollars for U.S. equipment and services. The country also has a low per capita consumption and high relative income, indicating more would be bought if available. For instance, it currently imports about 26,000 tons of newsprint a year, produces none.

Bolivia

Consumption increase is slight

Population: 3,311,000. Per capita paper consumption: 4 lbs.
Paper production: 900 tons
Consumption: 4,111 tons

—La Paz

Bolivia's per capita paper consumption increases slightly through the years and its imports go up accordingly, since it has only one producing paper mill. Fabrica y Manufactura de Cartones y Taleres Litograficos, located in Puralpura, La Paz, turns out about 800 tons of various grades each year.

Agriculture continues to be the major endeavor in this country and mining is the only industry of importance. Possibilities for expansion of the paper industry are remote at present.

Chile

Mills continue expanding; exports increase 35%

Population: 7,550,991. Per capita paper consumption: 19 lbs.
Paper and paperboard mills: 20, woodpulp mills: 3, straw or vegetable fiber mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	78,301	102,955
Woodpulp	48,262	54,241
Straw pulp	2,640	2,640
Paper and board imports	14,055	—
Paper and board exports (printing paper)	22,300	38,137
Woodpulp imports	37,400	36,619

Principal paper grades made: newsprint and magazine, kraft, sulfite, writing, book, paperboard
Principal paper imports from: U.S.A., Norway, Canada, Finland
Principal paper exports to: (newsprint) Argentine, Brazil, Uruguay, Mexico
Principal pulp imports from: Finland, Sweden, Canada

—Santiago

Chile continues to make progress in the paper field and the biggest news this year is the planning of a new 200-ton mill.

Bosques de Pinhue del Carmen SA is reportedly planning construction of a 200-ton newsprint mill near Chigauyante. Chile presently produces some 52,315 tons of news a year—an increase of 16,000 tons over 1958. A small amount is still imported, although less than last year.

The nation's largest paper mill, Cia Manufacturera de Papeles y Cartones SA, continues to grow. An additional drying plant has been added here which increased production capacity 20%. Its present capacity is 66,000 short tons. A new Voith machine which was put-on-line last year is responsible for the increase in newsprint production. Chile's newest mill Manufacturera de Papels y Cartones has also reached its designed capacity.

What effect the disastrous earthquakes and tidal waves of the spring will have on further expansion plans for the industry is not immediately known. Construction is progressing on a 77,000 ton kraft mill at Laja near Concepcion and a pulp mill with a 75,000-ton-a-year capacity.

Production 1,029,545 Tons

Total production has now reached 1,029,545 tons of paper and cardboard a year and some 57,000 tons of pulp. Pulp imports were lower this year than ever before and general indications are that imports of other grades are also down. In addition, Chile increased its export of printing paper from 22,300 tons to 38,137 tons a year in 1959.

Uruguay

Pulp capacity is limited

Population: 2,700,000. Per capita paper consumption: 50 lbs.
Paper mills: 5
Pulp mills: 2

Production (short tons)	1957	1958
Paper and board	40,000	41,500
Mechanical pulp	1,200	1,300
Wheat straw pulp	7,000	7,200
Paper and board imports	34,000	35,000
Woodpulp imports	22,000	22,090

Principal paper grades made: kraft, sulfite paper, book and writing, tissue, paperboard
Principal pulp imports from: U.S.A., Sweden, Finland

—Montevideo

Consumption has reached 80,000 tons in this small country located below Brazil. Yet Uruguay's pulp mill prospects still remain questionable. With limited forest resources, most of which are hard to reach, it seems likely that Uruguay will continue to import most of its pulp.

Its five paper mills, which do not include board mills, have a capacity of nearly 70,000 tons, are currently producing about 45,000. Another 6,000 tons is produced in its board mills. Bleached and unbleached sulfate and sulfite pulps are imported to make the difference but the largest import item, paperwise, is newsprint. It buys 30,000 tons a year.

Uruguay has joined several other Latin American countries to study plans for mechanical and semichemical pulp mills. Although it is presently producing about 7,000 tons of straw pulp, Uruguay's pulp needs are so diversified that it would need several small mills and the cost appears prohibitive.

Colombia

New Grace mill will satisfy most of its consumption

Population: 13,652,000. Per capita paper consumption: 25 lbs.
Paper mills: 2

Production (short tons)	1958	1959
Paper production	46,000	46,000
Mechanical pulp imports	600	650
Chemical pulp imports	24,231	24,500

Principal paper and pulp imports from: U.S., Canada, Sweden, Finland

—Bogota

Closely paralleling Colombia's rapidly rising standard of living is its per capita paper consumption. To satisfy some of this demand, W. R. Grace & Co. is rushing to complete its $1.6 million Papeles Grace de Colombia paper mill near Cali.

This mill will produce light kraft, bleached and unbleached light sulfite papers tissue, writing and printing papers. Its initial production is expected to be about 28,000 tons and it is hoped this will save about $8 million a year in paper imports.

Another exciting development for Colombia is the recently announced joint formation of Scott de Colombia SA, a converting mill which will be backed by Scott Paper Co., U.S.A., and two Colombian industrialists, Sr. John Gomez Restrepo and Sr. Mario Uribe Uribe.

There are currently three mills in Colombia producing various grades of paper including newsprint, sulfite, tissue and cigaret papers. A recent survey shows that Colombia will have to increase her capacity to nearly 65,000 tons by the end of this year to meet growing demands, another 35,000 tons by 1965.

Costa Rica

Abaca used in small mill

Population: 1,149,537. Per capita paper consumption: 14.2 lbs.
Paper and paperboard mills: 2
Paper production (short tons): 3,000
Paper and board imports: 4,000
Principal paper imports from: U.S.A., Scandinavia
Principal pulp imports from: U.S.A., Scandinavia

—San José

Costa Rica's two small mills located near here produce 3,000 tons of kraft paper a year from abaca, a very fast growing type of grass which is also the country's chief export item.

Its per capita paper consumption is some 14 lbs a year and 4,000 tons of this is imported, mainly from the U.S. and Scandinavia.

One of the mainstays of Costa Rica's economy is its sprawling lumber industry, which grows more important by the year. Extensive forests and fair transportation provide an attractive lure for development of pulp and paper mills but thus far little interest in this direction has been shown. Tests have also been made on *poro gigante* another fibre, and it too has been found acceptable for papermaking. Time alone will tell whether further interest will be shown in developing these resources.

Major imports to Costa Rica in 1959 included 4,349 short tons of newsprint; 1,265 tons of book and magazine paper; 2,345 tons of wrapping; 961 tons of cartons; 175 tons of paperboard and 56 tons of cigaret paper.

British Guiana

American firm given lease for pulp mill, starts work

—Georgetown

The Columbium Corp. of America has been granted a lease over about 500,000 acres of Crown Colony forest lands in connection with this proposal to manufacture woodpulp and alpha cellulose from mixed tropical hardwoods growing in this South American territory.

Clearing of ground, construction of workers' houses and construction buildings, and surveys for railways and roads into the wood tracts already are completed.

The Ministry of Trade and Industry reports that the capacity of this mill is to be 500 tons per day.

There has been considerable interest in the Guianas in the possible use of the wallaba tree for pulp and paper industries. It has been demonstrated that this tree can be processed by sulfate cooking for many kinds of paper, except the high strength papers.

El Salvador

Development studies underway

Population: 2,508,000. Per capita paper consumption: 7.5 lbs.
Paper and board mills: 1

Production	1958	1959
	(short tons)	
Paperboard	150	206
Paper and board imports	9,362	9,486

Principal paper imports from: Canada, U.S.A., Sweden

—San Salvador

During the past year, Instituto Salvadorena de Fomento de la Produccion (INSAFOP) completed the first part of a study concerning the possibilities of exploiting a cellulose and paper industry based on bagasse.

In El Salvador, the sugar cane industry produces about 50,000 metric tons of dry bagasse a year. A solid consumer market for bagasse paper products could be the five Central American republics. Of these, El Salvador is the smallest but one of the more progressive. At present a sweeping improvement of its electrical power and highway system is underway, financed by a $33 million World Bank loan. It is likely that bagasse pulping will get a foothold here. At

present the country's one small mill, Cia Casanellas J., produces about a ton a day of board on its 36 in. cylinder machine.

At present, 31% of the republic's imported paper and board a year comes from Canada, 24% from the U.S.A., another 24% from Sweden. Czechoslovakia, Holland and Norway also export small amounts to El Salvador.

Guatemala

Central America Common Market spurs mill expansion

Population: 3,600,000. Per capita paper and paperboard consumption: 6 lbs.
Paper and paperboard mills: 1; Vegetable fiber pulp mills: 1

Production (short tons)	1958	1959
Paper and paperboard	1,700	2,200
Vegetable fiber pulp	1,100	1,540
Paper and paperboard imports	10,000	13,200
Pulp imports	—	440
Paper and paperboard exports	900	1,210

Principal grades made: Kraft papers, sulfite papers, book and writing papers, and paperboard
Principal paper and paperboard exports to: El Salvador, Honduras, Costa Rica
Principal woodpulp imports from: U.S.A., Sweden, Canada
Principal paper and paperboard imports from: U.S.A., Canada, Sweden

—Guatemala City

A milestone towards the industrialization of Guatemala and the growing expansion of the Central American Common Market was reached this year when the first commercially salable kraft paper was manufactured June 6.

In making the announcement, Minor Keilhauer, president of Industria Papelera Centroamericana S.A., stated that this was the result of an expansion program at the mill at Esquintla, 40 miles west of Guatemala City, which included the installation of a 120 in. Fourdrinier machine.

The plant, he said, which also has a 65 in. cylinder board machine, now has an immediate annual capacity of 9,000 tons of kraft papers, bond, tissue and liner board as well as 6,000 tons of corrugated medium, tag, boxboard, index and other assorted boards. There was provision, Mr. Keilhauer said, for future expansion.

Industria Papelera Centroamericana S.A. was formed at the beginning of 1959 from the then-existing company Industria Papelera Guatemalteca, the famous lemon grass mill, and is jointly owned by Minor Keilhauer, Jaime & Enrique Arimany, both Guatemalan nationals, and Central National Corp., of New York City, a part of the Gottesman-Central National Organization.

Between the new Fourdrinier and the cylinder machines the requirements for Central America can be fulfilled for board, bond and kraft papers, it is said. Guatemala, Honduras and Salvador have signed an agreement for the free importation and exportation between them for nearly all products produced in these republics. Costa Rica and Nicaragua are expected to join these three countries in this agreement.

The Central American common market is rapidly becoming a reality and it will make available to Central America a market of approximately 10,000,000 consumers.

—Guatemala City

Industrial Development

With the new Industrial Development Law approved by the president and Congress of Guatemala at the end of 1959, industry has been given considerable protection and the law includes tax advantages to new and existing industries that wish to expand.

As a result of this new law, existing industries have expanded and new ones are in the process of being established, and as a result, demand for board and paper will increase considerably during 1960.

Multiwall Bag Plant

A good percentage of all the boxes now being used in the neighboring republics for different products are made in Guatemala. The new multiwall bag plant that was to start operating in May 1960, will use Guatemala paper. It is expected that most of the cement bags for Central America will be made in Guatemala.

During 1959 the Export Import Bank approved a $5,000,000 loan to Guatemala to be used by industry. This loan will help develop new and increase the capacity of existing industries.

Several years ago Mr. Keilhauer pioneered in the use of banana grass, the residue of his factory processing banana oil, in the manufacture of paperboard. This was the first raw material of his pulp and paper mill. Now with expansion into various paper grades, imported woodpulps are being used, but along with the local grown vegetable fibers.

Ecuador

Raw material and good sites fail to attract developers

Population: 4,000,000. Per capita paper consumption: 7 lbs.
Paper mills: 1. Paperboard mills: 4. Straw or vegetable fiber pulp mills: 1.
Paper and board production (short tons): 4,000
Pulp: 3,600
Principal grades of paper made: kraft, paperboard
Principal paper imports from: Canada, Sweden, U.S.A., Chile

—Quito

Regardless of highly optimistic reports by the Inter-American Investment Opportunity Service that Ecuador has strong paper industry possibilities, paper production here has not changed in the past year.

The largest mill is still Industria Papelera Ecuatoriana, C.A., (IPECA) the only integrated pulp and paper mill in the country located at Latacunga. There are four other paperboard mills, located in Quito and Guayaquil. In all, some 4,000 tons of paper and paperboard are produced here.

Raw materials most used here are banana fiber and grasses such as abaca and stipa. In addition, there are some 150,000 acres of virgin forest with good drainage, mild climate and relatively cheap labor which could be used for production of woodpulp and chipboard but it has yet to attract builders. Imports of paper and board come mainly from Canada, Sweden, U.S.A. and Chile.

Peru

One mill produces 90% of total paper output

Population: 10,213,000. Per capita paper consumption: 11 lbs.
Paper mills 6

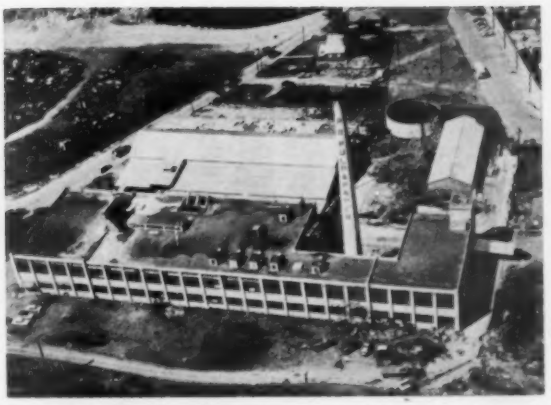
Production (short tons)	1959	1959
Paper production	42,000	55,000
Pulp production	19,255	21,000*
Newsprint imports	15,000	16,000*
Pulp imports	9,000	10,000*

Principal imports from: Canada, Finland, Sweden, Norway, U.S.A.
***Estimated.**

—Paramonga

With completion of the $1.5 million expansion at the 20-year-old W. R. Grace mill here, Peru's total production has risen to 55,000 tons, a 15,000 ton increase. The Grace mill now produces annually some 50,000 tons of all grades including writing and fine papers on its three machines.

The remainder of Peru's paper products are produced in five small



PUERTO RICO'S PAPER INDUSTRY CONTINUES TO GROW as evidenced by these pictures. At left, W. R. Grace's new mill which produces kraft from 75% bagasse and 25% kraft waste; at right, Puerto Rican Paper Products mill near Guaynabo, which currently produces mainly containerboard.

mills. If plans for a new $11 million newsprint mill to be located at Iquitos on the Ucayli River are completed, the proposed 18,000 tons a year it would produce would satisfy Peru's newsprint needs.

Imports

Its principal imports include bleached sulfite pulp, used mainly for the manufacture of rayon, and unbleached sulfite which is mixed with bagasse at the Grace mill.

Puerto Rico

Paper industry thriving

Population: 2,336,000. Per capital paper consumption: 12 lbs.
Paper and paperboard mills: 2; woodpulp mills: 1

Production	1958	1959
	(short tons)	
Paper and paperboard	24,000	24,000
Bagasse pulp	12,000	12,000
Paper and board imports	19,391,679	20,581,234
Paper and board exports	3,201,557	3,582,790
Woodpulp imports	18,316	5,763

Principal paper imports from: U. S. (mainland), Canada
Principal paper exports to: U. S. (mainland), Dominican Republic
Principal pulp imports from: U. S. (mainland), Canada

—San Juan

This Caribbean island is continuing to lead the way in paper activities in Latin America. In addition to the gleaming new mill started up last year by W. R. Grace, other mills have expanded during the year past.

Caribbean Paper Mills in San Juan has just completed a rebuild of its cylinder machine, which is producing cylinder board, linerboard and folding grades. The mill also boasts a box plant.

San Juan has become an extremely active converting center. In addition to Caribbean Paper Mills, Laboratorios Sein Inc. is producing folding boxes for pharmaceutical products; Impresores Inc. manufactures folding boxes, Puerto Rico Container Corp. makes paper bags, The Puerto Rico Container Co., owned by W. R. Grace, produces corrugated carton containers, cardboard and paperboard containers; and Jose Rodriquez Ema also makes set-up and folding boxes.

Not far away in Arecibo, Grace y Cia, the new bagasse mill which went into production last year, boasts a cylinder machine and a combination Fourdrinier and cylinder machine. Pulp is produced here from 75% bagasse and 25% kraft waste. It is managed by Carl Hackbarth who is well known in the Southern U.S. paper industry.

The other pulp mill is Puerto Rican Paper Products in Guaynabo which produces some 60 tons a day of bagasse pulp. The paper mill has a Downingtown board machine.

A new wallboard and hardboard plant, financed in part by the Government Development Bank is also under construction and there have been proposals for a second wallboard plant as well as a particleboard mill.

Nicaragua

Paper industry remote

Population: 1,378,000. Per capita paper consumption: 8.2 lbs.
Paper mills: none
Paper imports: 5,000 short tons

—Managua

This is the largest of the Central American countries and it has probably the most valuable forest reserves in Latin America. But the paradise is lost in impenetrable wilds, incessant rains and poor transportation.

Valuable industrial raw materials are thus ruled out. A study by Compania Minera la India shows the republic to be a remarkably prolific source of hardwoods. The fact there are 12 to 15 different species would affect the uniformity of pulp, if it were possible to produce it here.

West Indies

Bigger market for paper seen; Jamaica has converting plant

Population: 3,800,000. Per capita paper consumption: 10 lbs.
Paper production: none.
Imports of paper: 30,000 tons.

—Kingston, Jamaica

The West Indies Federation, which joins together the British island possessions in the Caribbean—Jamaica, Trinidad, Bahamas, Barbados, etc.,—with self-government for a far flung dominion, is going to be a bigger market for paper.

There are a lot of hardwoods in Jamaica, but authorities here think sugar cane bagasse should be the raw material for a paper industry on this island. A paper converting plant recently was built here.

In the Bahamas, logging has recently been carried out, with pulpwood shipped to the Owens-Illinois kraft mill in Jacksonville, Florida.

NEWSPRINT FROM 100% BAGASSE is made in this mill of Técnica Cubana, Cuba, by process developed by Joaquin de la Roza Sr. Mill was built by De la Roza Corp., taken over by Cuban government early in 1959.

Cuba

Current data not available

Population: 6,466,000. Per capita paper consumption: 73 lbs.
Paper mills: 8; pulp mills: 2

	(Short tons) 1957	1958
Paper production	102,000	161,000
Paper imports	112,000	114,200
Chemical pulp imports	62,000	81,000
Dissolving pulp imports	49,000	52,000

—Havana

Cuba has eight paper mills and two integrated pulp and paper mills, one in Cardenas, the other near Trinidad in Southern Cuba. Tecnica Cubana, at Cardenas, a newsprint mill, is designed to produce 80 tons a day from bagasse pulp. The other mill, Papelera Pulpa S.A., makes a variety of grades.

Under the Castro government, the Tecnica Cubana mill has been intervened and is now operated by the government. Information on the Trinidad mill is not available at this time.

The remaining mills, most of which are located in Havana, are converting operations.

Paraguay

Has one small mill

Population: 1,677,000. Per capita consumption: 4 lbs.
Production: 450 tons roofing board
Imports: 3,150 tons

—Asuncion

Papelera Paraguaya, the country's one mill, produces some 450 tons of roofing board a year. And while the country is abundant in forest resources and water is plentiful, the extremely limited consumption of paper makes it uneconomical to promote further pulp or paper expansion. At present about 3,150 tons of paper are imported into Paraguay a year.

Haiti

Mills potential, politics not

Population: 3,500,000. Per capita paper consumption, 4 lbs.
Production: none

—Port-au-Prince

It is an unfortunate circumstance, but Haiti's continuingly turbulent politics prevent any development of its paper industry. This becomes more and more unfortunate as bagasse pulping increases in popularity. The past three years have seen growing interest in bagasse paper in Latin America, especially by big U.S. paper companies.

Haiti presents many attractive industrial lures but its see-saw political situation virtually rules out development of them. Always on the brink of revolution, the country frightens off interested companies.

Dominican Republic

Politics delay developments

Population: 2,843,415. Per capita paper consumption: 6 lbs.
Paperboard mills: 1.

	1958	1959
Paperboard production (short tons)	100	100
Paper and board imports	7,500	7,950

Principal paper imports from: U.S., Norway, Sweden, Finland

—Cuidad Trujillo

Like most of the Caribbean islands, the Dominican Republic is extremely fertile with sugar, cocoa, tobacco and tropical fruits growing in abundance. The sugar industry offers excellent possibilities for development of a bagasse pulp and paper industry.

Although plans have been in the

BAGASSE HOLDS GREAT POTENTIALS as fiber source, is already seeing important use. Photo shows sugar cane plantation in Haiti, a nation in need of reforestation. (United Nations photo)

discussion stage for more than two years on establishment of an 8,500 ton a year bagasse mill for manufacturing newsprint, writing and printing papers, nothing concrete has been done. Main reason for this seems to be the continuing political unrest in the Republic and the danger of similar economic problems arising here as in Cuba.

One small paperboard mill currently is producing about 100 tons of board a year. The Republic imports some 7,950 tons of paper and board a year, mainly from the U.S. and Scandinavia.

Honduras

Government urges bids to establish industry

Population: 1,887,389. Per capita paper consumption: 4.6 lbs.
Paper and paperboard mills: none

	1958	1959
	(short tons)	
Paper and paperboard imports	4,380	3,916*

Principal paper imports form: U.S.A., Norway, Germany
***Through October**

—Tegucigalpa

Of all Central American nations, Honduras claims its forest resources best suited to industrial use. Total forest acreage is 4,873,500 hectares (1 hectare = 2.47 acres).

Dry forests account for 424,000 hectares; non-coniferous, 2,582,000, coniferous, 1,837,500, and highlands, 30,000. According to surface occupied, Honduras forest lands are broken down further: mountainous, 2,918,000 hectares; in plains and valleys, 1,955,500; with pastures, 1,169,000; and without pastures 3,703,900.

Considering the vast forest wealth, government officials requested FAO experts to set up a project for pulp and paper manufacture. The plan would provide technical, economic and financial basis for mill construction as part of a program for economic integration of the isthmus.

The FAO group recommended a cellulose and paper industry be established without necessity of Central American market capacity reaching a pre-determined level.

The study was undertaken in the forest zone of Olancho dept., an area of 265,000 hectares (654,815 acres) pine and about 100,000 hectares (247,100 acres) broad leaved species. The region is compact and lends itself to coordinated industrial exploitation.

National Bulk Carrier Inc. submitted forest zone proposals similar to those of FAO. Such proposals—incorporating request for permission to exploit the region and establish a cellulose and paper facility—are being studied by the government.

To this end, a special government committee is drafting a basis for exploitation of the Olancho forests. Object is to eventually seek international bids on the project as required by the constitution.

Under its proposal, National Bulk Carrier would lease Olancho forests and provide capital investment sufficient to embrace equipment installation, penetration roads, navigation canals, schools, hospitals and other worker benefits. The organization would participate in international bidding.

The Honduran government will negotiate with any pulp and paper company throughout the world that abides by rules drafted by the FAO commission. Such rules are inspired by the desire to attract foreign capital for the rational use of natural resources under conditions that would represent reciprocal benefits. That is, any firm that wishes to make industrial use of the forests has the guarantee that it will derive the return expected on its invested capital. At the same time, Honduras may expect a fair benefit for its participation in the enterprise.

In becoming established in Honduras, the pulp and paper industry would enjoy advantages of the Treaty of Economic Association signed recently by Guatemala, El Salvador and Honduras.

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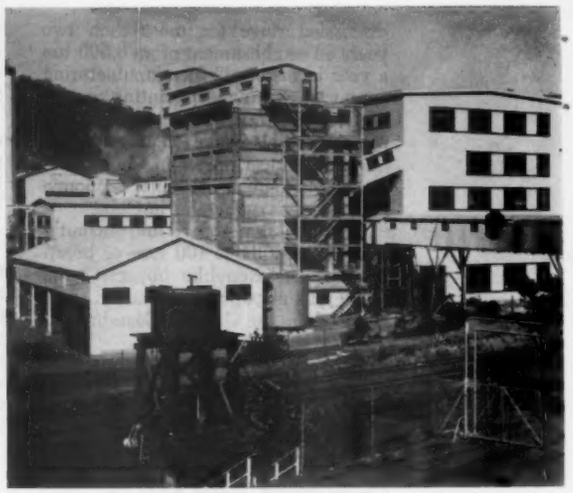
A NEW AERIAL VIEW OF AUSTRALIAN NEWSPRINT MILLS AT BOYER, TASMANIA. In foreground on left, is wharf warehouse and behind that is the paper machines building, then the screen room, grinder room and power station. Engineering workshops are farther back on the left. Across the road, on the right side, in the foreground is kraft pulp storage. Back of that is an office block, then steam plant, mill stores and bleachery. The new cold soda pulping plant, which has gained worldwide fame for ANM, is farther back on the right. Just a bit farther back is the woodmill, and the log piles can be seen.



CLOSEUP OF COLD SODA PULPING PLANT which has earned a worldwide reputation for Australian Newsprint Mills. At left is soda storage and dissolver; behind it the chipping plant. In middle foreground, circular tank is NAOH storage; chip elevators and bins behind it. Soda pulping plant at right.

OCEANIA

Australia

Remarkable expansion by many pulp-paper companies

Population: 10,200,000. Per capita paper and paperboard consumption: 177 lbs.
Paper and paperboard mills: 18; Woodpulp mills: 5; Vegetable fiber mills: 1

Paper and paperboard Production (short tons)	1958	1959
Paper and paperboard	473,000	513,000
Total woodpulp	219,500	235,200
Chemical woodpulp	—	146,000
Paperboard	190,000	213,000
Mechanical pulp	—	67,600
Newsprint	91,000	93,000
Vegetable fiber pulp	—	4,000
Paper other than Newsprint	169,000	207,000
Paper and paperboard imports	305,760	336,000
Woodpulp imports	104,790	144,500
Paper and Paperboard exports	3,980	12,300

Principal paper grades made: All kinds
Principal paper and paperboard exports to: New Zealand, Australian Territories, Asia
Principal woodpulp exports to: U.K.
Principal woodpulp imports from: New Zealand, Scandinavian countries, Canada
Principal paper and paperboard imports from: U.K., Canada, Scandinavian countries

By DR. WILBY E. COHEN
Editor for Australia

—South Melbourne

With Australian population and per capita consumption both increasing steeply, demands for and sales of paper and paperboard are continually advancing towards new peaks and the industry is meeting this challenge within practical limits by increasing its output of basic lines. In addition, through technical progress, it is widening its range of major products.

Various construction projects leading to more and better production have been completed. Work on others is being accelerated in order to extend production capacity as quickly as possible. And new expansion projects, which are to tap more of the indigenous raw materials, have been announced.

With such rapid growth, the problem of ensuring continuity of pulpwood supplies in perpetuity is being anticipated by activity in natural forest regeneration and in the planting of indigenous hardwoods and exotic pines. It has been stated that more than 80% of the raw material used by the industry is now obtained locally.

Additional production capacity required to meet the ever-increasing demands for paper and paperboard is being attained by a combination of rebuilding and extending existing machines and of installing new units.

Extension and new construction projects which have been completed during the past year, include that of Australian Paper Mfrs. Ltd's Maryvale No. 1 machine to increase its capacity by 11,000 short tons per annum; and that of the erection and start-up of Associated Pulp & Paper Mills Ltd.'s 11,000 ton cold soda plant. The latter has made possible the company's entry into the magazine paper field with papers suitable for applications ranging from multi-color printing to those where half-tone illustrations are not involved. The cold soda process has also enabled Australian Newsprint Mills Ltd. to reach a new peak in newsprint production, the output for the year ending June 30, 1959 having been more than 93,000 short tons, i.e. exceeding that of the previous year by more than 2,200 tons. Much of this gain is attributed to the faster machine speeds made possible by having 22% of cold soda pulp in the newsprint furnish.

Scheduled for completion and start-up late in 1960 is APM's new kraft

paper machine at Botany, N.S.W., which will have an initial capacity of 44,000 short tons but which can have an ultimate capacity of 110,000 short tons. In addition, this company hopes to double the capacity of its paperboard machine at Petrie, Queensland by mid-1961. An entirely new forming section of the "Inverform" type will replace the conventional cylinder-forming section.

APPM has in hand an expansion program at its Burnie mill mainly in the form of its No. 10 machine which will have a capacity of 34-39,000 short tons and which, in addition to making wood-free papers, will be capable of making magazine printing papers. Another item in this program is a second continuous pulping installation.

ANM's new developments, which are currently in hand, include a caustic-chlorine plant, a bleachery for semi-chemical pulp and an expanded water supply system.

Other developments in hand are the construction of a woodpulp and tissue mill to be operated at Millicent, South Australia, by Apcel Ltd. using locally grown pines. This is a joint venture between Cellulose Australia Ltd. and APM and start-up is scheduled for late 1960.

Cellulose Australia Ltd. is also expanding its paperboard mill by replacement of existing grinding and auxiliary equipment.

Construction of the tissue paper plant to be operated at Box Hill, Victoria by Bowater-Scott Pty. Ltd., is also progressing.

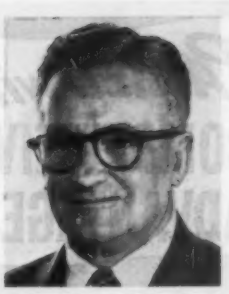
Will Tap New Forests

New developments which will further tap forest resources include the new NSSC pulp mill to be erected by APM at the mouth of the Kermandie River in Tasmania. Features of this mill are its capacity of 26,880 short tons, the stockpiling of pulpwood in chip form and the pelletizing of pulp for shipment to APM's Botany Mill. Construction is scheduled to start in 1960 and start-up is planned for mid-1962.

Another new development which has been announced is the erection by APPM of an additional plant at Wesley Vale, near Latrobe and near the port of Devonport on the northwest coast of Tasmania. This has been described as the largest single industry development in Tasmania for many years and it could ultimately involve a capital expenditure of £20 million ($45 million). The first unit planned is a particle board plant to be followed later by a paper machine. Production capacity of 28,000 short tons of paper and other wood fiber products within 10 years and of 56,000 short tons within 20 years has been mentioned. It is probable that this new project of APPM will eventually amount to a duplication of the plant at Burnie, i.e. integration of wood-using industries.

There have also been developments in associated wood-using industries. Following the takeover of Masonite Holdings Ltd. by Colonial Sugar Refining Co. Ltd., it was agreed that Masonite would function as a separate unit. The Masonite "dry-process" hardboard plant at Eildon was closed in November 1959 for at least a year because of technical difficulties in applying the "dry-process" to eucalypt woods. On the other hand, CSR is now constructing a hardboard plant at Bacchus Marsh, Victoria, and anticipates production to start by January, 1961 using a plant which is basically of Swedish design. Capacity will be 50 million sq. ft. per annum. Also, a new particle board plant to use *Pinus radiata* thinnings is under construction at Mt. Gambier, South Australia, for Particle Board of Australia Pty. Ltd. and start-up is anticipated late in 1960.

The growth of the Australian pulp and paper industry has encouraged



DR. WILBY E. COHEN is senior principal research officer for the Commonwealth Scientific and Industrial Research Organization of the Division of Forest Products in Australia. He writes: ". . . Australia is widening its range of major products . . ."

AUSTRALIA—GENERAL

	No. of Mills	No. of Employees	Value of Materials (In Thousands of Dollars)	Value of Output (In Thousands of Dollars)
1951	14	6,336	$23,300	$37,800
1952	14	6,750	24,000	42,000
1953	16	7,237	35,000	70,000
1954	18	7,179	34,000	73,000
1955	20	7,611	39,000	86,000
1956	17	7,480	42,000	87,000
1957	17	7,614	n.a.	n.a.
1958	17	7,903	n.a.	n.a.
1959	18	8,088	51,500	112,400

AUSTRALIA—PAPER

(in short tons)

	Production Newsprint	Production Board	Total All Paper & Board
1946-47	31,734	76,563	185,870
1947-48	31,335	83,213	192,320
1948-49	30,260	85,307	193,460
1949-50	30,472	99,519	205,196
1950-51	33,000	103,000	220,000
1951-52	33,000	110,000	235,000
1952-53	70,000	112,000	270,000
1953-54	70,000	120,000	330,000
1954-55	77,000	170,000	366,000
1955-56	88,480	116,768	396,557
1956-57	89,200	179,200	444,192
1957-58	90,720	188,160	469,280
1958-59	93,000	213,000	513,000

Note: Australia's fiscal year July 1-June 30.

AUSTRALIA—WOODPULP

(in thousands of short tons)

	Chemical Prod.	Chemical Imports	Mechanical Prod.	Mechanical Imports
1949	63	44	38	3
1950	68	37	38	1
1951	75	46	40	2
1952	77	53	47	6
1953	70	28	40	1.5
1954	90	48	64	5
1955	110	70	66	4
1956	136	69	71	4
1957	146	112	73	4
1958	157	105	74	4
1959	146	144	68	4

Source: Australian government, U. S. Pulp Producers Assn., Canadian P & P Assn.

AUSTRALIA—Production, Imports, Exports, Consumption

(In short tons)

Year	Product	Production	Imports	Exports	Apparent consumption	Per capita consumption (lb)
1958-59	Pulp	232,000	140,000	224	372,000	—
	Newsprint	93,000	216,000	—	309,000	62
	Other papers	199,000	79,500	5,600	273,500	55
	Paperboard	225,000	11,200	—	236,000	47
					Total	164
1959-60	Pulp	241,000	168,000	—	409,000	—
	Newsprint	99,500	243,000	—	342,500	67
	Other papers	227,000	89,600	5,600	311,500	61
	Paperboard	228,000	13,400	—	242,000	48
					Total	176

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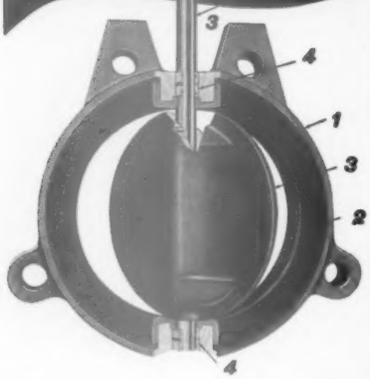

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many overseas suppliers of equipment to set up subsidiaries in this region. Notable is that of the Walmsley (Bury) Group Ltd. which has 19 paper machines of its manufacture already in use in Australia and five more under construction.

Looking to the long-term needs of the growing market in Western Australia, APM has purchased a site near Perth on which it hopes eventually to supply those needs.

New Zealand

Records new production high, with plans to double capacity

Population: 2,335,00. Per capita paper consumption: 161 lbs.
Paper and paperboard mills: 5. Woodpulp mills: 3.

Production	1958	1959
	(short tons)	
Paper and paperboard	169,800	180,500
Chemical woodpulp	147,500	162,100
Mechanical or groundwood pulp	115,900	115,000
Paper and board imports	64,814	61,239
Paper and board exports	49,766	53,649
Woodpulp imports	9,572	9,844
Woodpulp exports	77,238	86,045

Principal paper grades made: Newsprint, kraft, paperboard, tissues
Principal paper imports from: Great Britain, Canada
Principal paper exports to: Australia
Principal pulp imports from: Sweden, Finland, Norway
Principal pulp exports to: Australia, Great Britain

—Wellington

Pulp and paper are really scoring here and all indications point to the fact that this is "only the beginning." With a record production year behind it, New Zealand is planning to double its 180,000 ton capacity within the next few years.

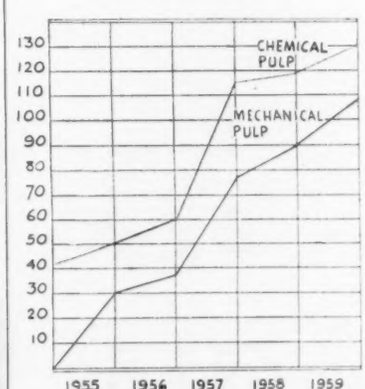
The three major integrated mills are all presently undergoing expansion programs and the trend is certainly toward self-sufficiency in forest products. It is expected that when these expansions have been completed, New Zealand will be in a position to enter the paper export market, thus making the country less dependent on agricultural export earnings.

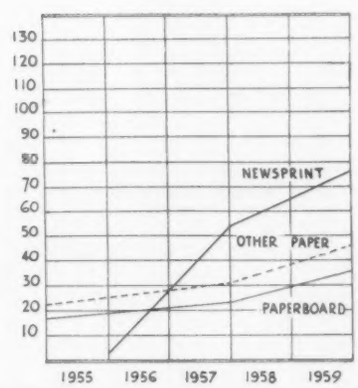
An important development was the recent formation of Bowater Reeds New Zealand Corp., Ltd., a joint venture between Bowater Paper Corp., Ltd., and Albert E. Reed Co. Ltd. which has invested $2.8 million in the Tasman Pulp & Paper Co. Ltd. in Auckland. This mill, one of the "Big Three," was formerly a government-owned plant.

In addition to supplying operational and technical assistance and serving as consultant-engineers for the project, the new company will increase the annual production of this newsprint mill to 180,000 tons with addition of a second paper machine.

Now under direction of D. W. Timmis, formerly first vice pres. of Bowaters Southern Paper Corp., U.S.A., the plant expansion including the Beloit-designed Walmsleys-built 2500 fpm machine will cost some £10 million and be completed by 1962.

N. Z. Forest Products Ltd. at Kinleith now has its second paper machine in production and has a third machine on order. The £1 million machine is producing glazed kraft for wrapping. A third machine, costing £1.25 million, will be installed at Canterbury, where the company has applied for a licence to build a new





SOARING PULP AND PAPER PRODUCTION in New Zealand (in thousands of tons). Production is expected to double in next five years.

FAST-GROWING PINE, planted in 1920 in Kaingaroa forest in New Zealand, is now being logged for Tasman Pulp & Paper Co. Some 12,000 cu. ft. of wood per acre was obtained from clear-felling for construction of new road through the area shown.

mill. It is expected to be in production in three years and the company is contemplating a fourth machine for installation in the Kinleith mill. A chlorine plant which was recently started up is expected to save the company about $100,000 a year. It formerly imported the chemical. A paper increase from 34,750 tons to 78,400 tons a year is expected from the overall expansion plans.

At Whakatane Board Mills, Ltd., plans are now underway to install a third board machine as well as ancillary equipment and a 35,500 pound pilot plant for bleaching semi-chemical pulp is being considered. A 32% increase in groundwood pulp output has also been reported as a result of adding a new Kamyr grinder. Board capacity here was increased from 11,000 tons in 1939 to 40,000 tons at the end of last year. The third machine could push this figure to 80,000 tons.

N.Z. Paper Mills, a small paper company in the South Island, is also planning to produce its own mechanical and semi-chemical pulp and thus become independent from either imported or New Zealand pulps.

Part of the success of the industry in New Zealand can be attributed to the development of pulps from radiata pine. Sufficient experience has now

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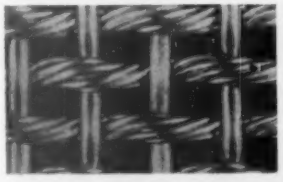

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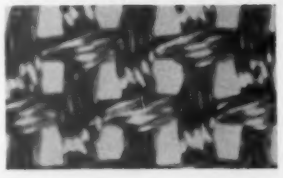

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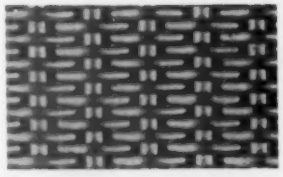

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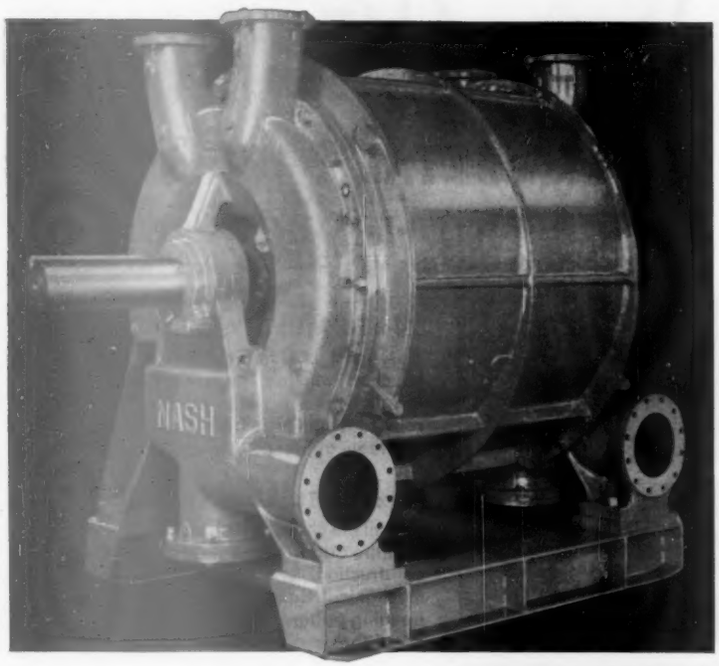

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The new Nash 5308-A shown above, has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

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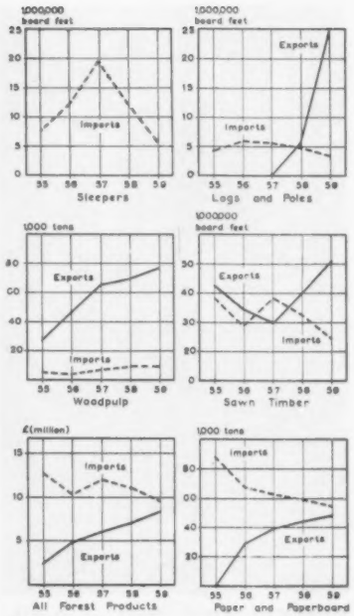


NEW ZEALAND TRADE in forest products, in long tons (2240 lbs.) Source: N.Z. Dept. of Statistics.

been gained with both groundwood and sulfate pulps produced from radiata pine, according to A. R. Entrican, N.Z. Forest Service, to demonstate that this species ranks among the world's best paper making woods. For instance newsprint users in both New Zealand and Australia are finding that the Tasman newsprint is among the strongest, if not the strongest, newsprint manufactured in any part of the world. The radiata pine fiber appears to have exceptional strength properties, whether judged by bursting, tensile or tearing strength of the papers into which it is manufactured.

Structural insulating and hardboard are also manufactured from radiata pine by New Zealand Forest Products Ltd.

NEW ZEALAND—PAPER PRODUCTION

(in short tons)

Year	*Newsprint*	*Other Paper*	*Paper Board*	*Fiber Board*
1939	—	7,003	7,414	—
1944	—	7,095	15,998	7,685
1949	—	7,964	16,437	15,149
1954	—	25,193	19,912	21,647
1955	10,080*	31,532	22,652	23,901
1956	59,024	34,538	27,700	23,985
1957	72,478	42,558	31,676	25,520
1958	84,334	49,128	36,382	25,794
1959	85,214	54,500	40,787	27,810

*First newsprint made in 1955.

NEW ZEALAND—WOOD PULP

(in short tons)

Year	Production Mechanical Pulp	Production Chemical Pulp	Total Imports	Total Exports	Consumption
1939	243	—	6,966	—	6,760
1944	17,286	—	13,991	—	25,421
1949	23,606	—	5,742	—	33,345
1954	33,116	48,388*	5,984	21,933	62,029
1955	42,553	68,762	6,117	30,622	83,838
1956	85,005	129,274	4,073	53,038	142,316
1957	101,697	132,872	7,655	72,793	167,543
1958	115,933	147,513	9,572	77,238	196,261
1959	115,040	162,110	9,844	86,045	210,000

*First chemical pulp made in 1953.

Philippines

New mills and much additional capacity being planned

Population: 24,000,000. Per capita paper consumption: 8 lbs.
Paper and board mills: 8
Bagasse pulp mill: 1

Production in short tons	1958	1959
Paper & paperboard	29,700	35,695
Bagasse pulp	6,050	7,200
Woodpulp imports	10,930	11,983
Paper imports	114,234	147,352

Principal grades made: Kraft, book and writing, paperboard, tissue
Principal paper imports from: U.S.A., Canada, Japan
Principal pulp imports from: U.S.A., Sweden, Canada

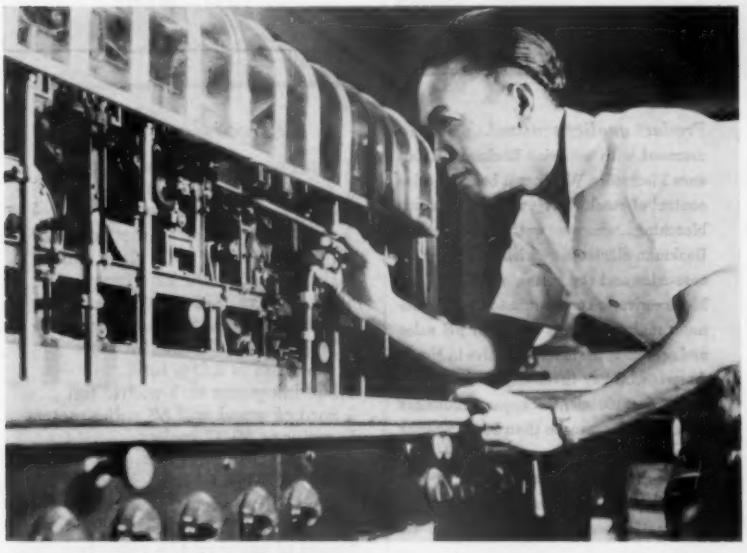
—Manila

Potentially one of the most important pulp and paper developments in the Far East or in the whole Eastern world, for that matter, may be an expansion of the Don Andreas Soriano lumber operations at Biswick Bay, Philippines.

Production of kraft paper would be made from waste from Biswick Bay Lumber Co. lumber and veneer operations. Newsprint might also be produced. The company has already done much basic research and concluded that the projects are technologically and economically feasible.

Two Interlocking Firms

There are two main timber concessions at Biswick Bay; one is Biswick Bay Lumber Co., the second, Biswick Industries Inc. These are unusual types of interlocking or semi-interlocking companies with some mutual



RESEARCH IN PHILIPPINES to promote forestry resources has been undertaken by recently-established Forest Products Research Institute. Timber testing, veneer and plywood research and study into possibility of setting up a pulp and paper industry form important part of this program. Photo shows technician checking a paper machine making wrapping paper from "White Lauan" sulfate pulp. (United Nations photo)

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stockholders. Biswick Industries Inc. will be parent of the pulp and paper mill. Biswick Industries has not yet logged but is due to start this year; Biswick Bay will do initial logging. Biswick Bay would guarantee a certain amount of waste product for the pulp and paper mill. The two concessions are adjacent.

Other New Mills

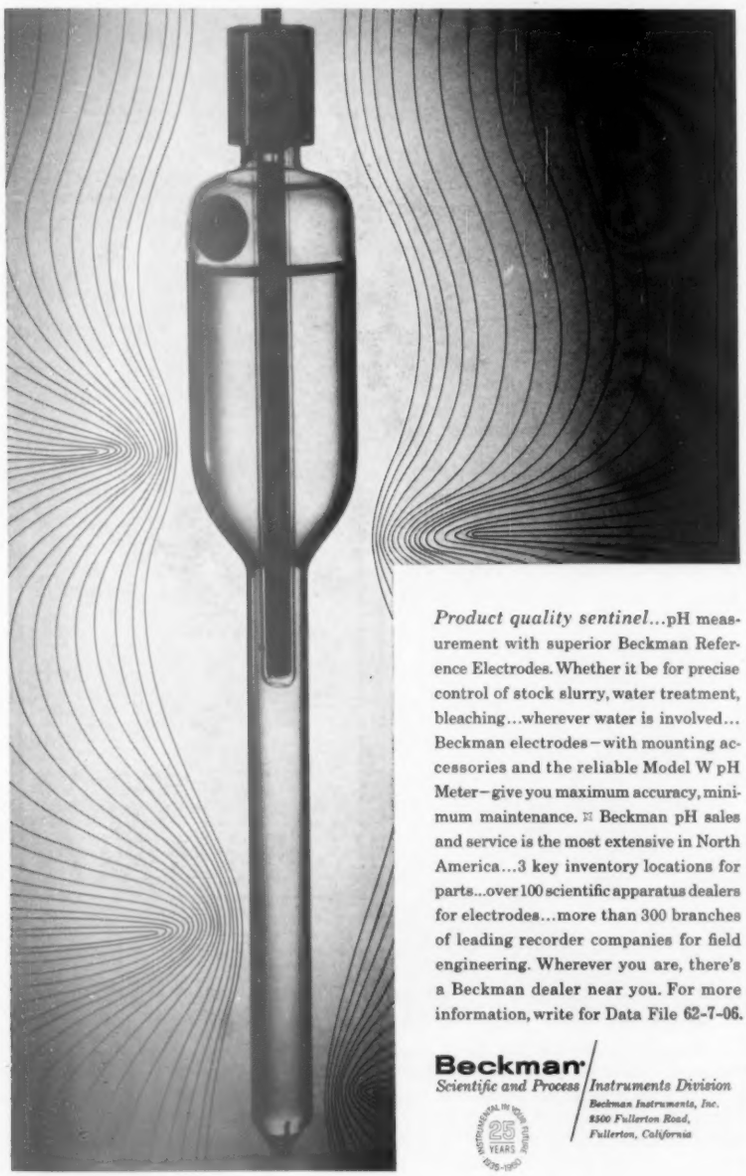
Of the eight new mills approved by the National Economic Council (see table), one with a rated annual capacity of 6600 short tons was under construction in 1959 and two have received loans from the U.S. Development Loan Fund.

One of the latter, the Bataan Pulp and Paper Mill, received a DLF loan of $5.3 million to help finance the construction of a P16.5 million plant. This plant is to be the first integrated pulp and paper mill in the country with an annual rated capacity of 19,800 short tons for the production, from Philippine bamboo, of such paper products as bond, litho, newsprint and book paper. It reportedly acquired from the Philippine government a 40-year concession on some 76,601 acres of land in Bataan for the planting and harvesting of bamboo.

The other firm, the Bago Pulp and Paper Co., received a DLF loan of $5.3 million recently to help finance the construction of a P20.5 million mill with a rated annual capacity of 19,800 short tons for bagasse production of cultural paper and other paper products.

PHILIPPINE MILLS
Approved by National Economic Council

	Planned Added Capacity (short tons	*Estimated Year of Completion*
Bataan Pulp and Paper Mill	19,800	1961
Bago Pulp and Paper Co.	19,800	1961
San Miguel-Bislig Mill	66,000	?
Kewg Hua Paper Mill	6,600	1960
Cclem Paper Mill	6,600	1960
Arco Pulp and Paper Mill	6,600	1960
Atlantic Pulp and Paper Co.	6,600	1961
Nasario Paper Mill	6,600	1960
Proposed Mills under Reparations:		
Sta. Anita Paper Mill	11,550	?
Calvento Paper Co.	1,320	?
Mactan Paper Co.	8,250	?
Total:	194,370	



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Conversion Factors

1 short ton = 2,000 lbs.
1 metric ton = 2,204.6 lbs.
1 long ton = 2,240 lbs.
1 short ton = 0.90718 metric tons
1 metric ton = 1.1023 short tons
1 short ton = .892 long tons
1 long ton = 1.12 short tons
1 metric ton = .9842 long tons
1 long ton = 1.016 metric tons
1 kilogram = 2.205 lbs.
1,000 kilograms = 1 metric ton
1 cord of wood = 2.55 cubic meters
1 meter = 39.37 inches
1 cord = 90 cubic feet (not counting air space)
But usually air space is counted, therefore
1 cord of wood = 128 cubic feet
1 cord of wood = 3.62 cubic meters
1 hectare = 10,000 square meters
1 hectare = 2.47 acres
2 cords wood = about 1,000 board ft.

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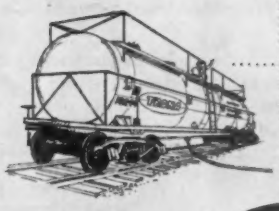

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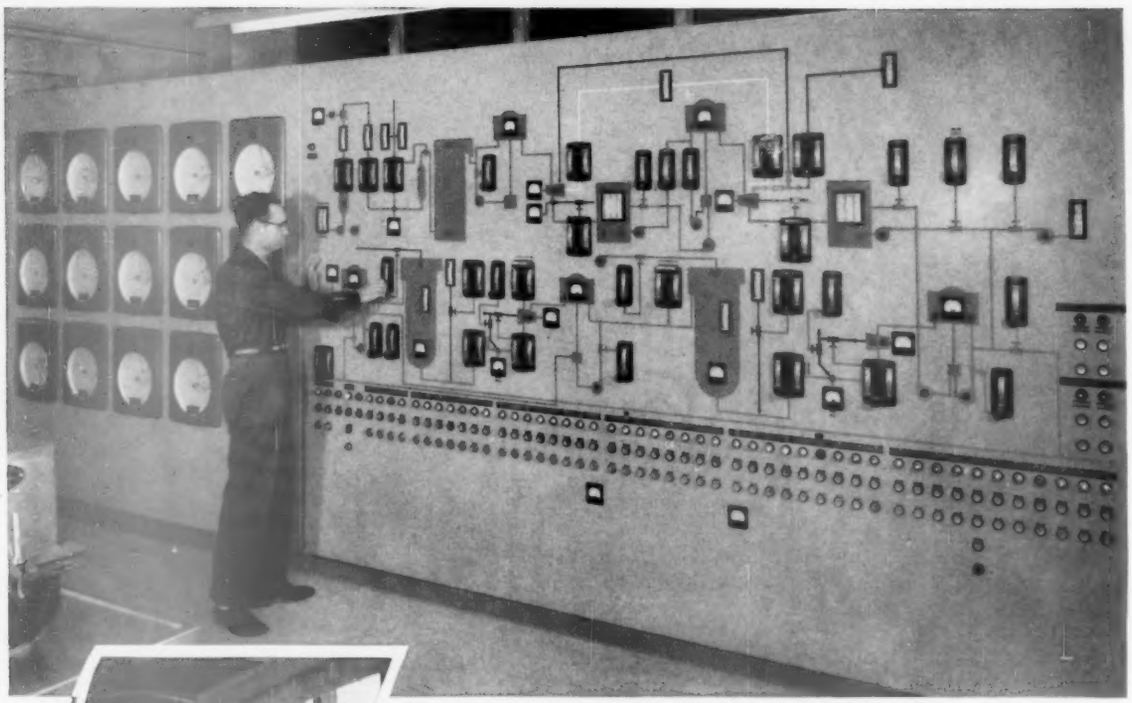

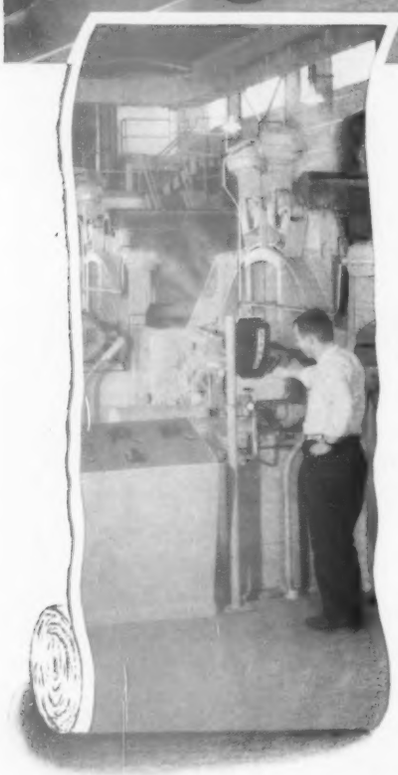

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New Approach to Exports

Statistics find balance between income and literacy to point way to better export trade—but don't answer all questions

By FRANK MEISSNER, Ph.D.*
Stanford Research Institute

● With a sales volume of more than $12 billion, pulp and paper is one of the largest U.S. industries. Although some 85% of our pulp and paper consumption is produced in this country, we are the world's largest importers. In 1959 the value of imports was $1.1 billion. This compares to an export of one-third billion dollars, leaving a trade deficit of some $763,000.

Interest in Foreign Markets

The low level of paper exports reflects to some degree the industry's reluctance to face the problems of tariffs, quotas, currency restrictions, transportation costs and other difficulties generally associated with foreign trade. A more important reason, however, has been the fact that the industry had plentiful markets for its products in this country and therefore did not have to go abroad to sell them. In recent years, the industry has expanded productive capacity faster than domestic demand has increased. As a result, manufacturers are seeking new outlets for production.

Another factor that has changed the manufacturers' attitudes toward exports is the rapidly-expanding consumption of paper in foreign markets. Demand outside the U.S. is well below the level here but is increasing fast. In western Europe, for example, consumption is rising at a rate of about 10% a year.

Improvements in standards of living in other parts of the world also are resulting in a sharp pick-up in paper use. Production and resources in these countries are not expected to be sufficient to meet increased needs, and supplies will have to come from countries that have surplus production, such as the United States.

Objective

With this renewed interest in exports it becomes desirable to develop some criteria for evaluating potential for paper consumption in countries that are likely to become either importers of U.S. pulp and paper or might welcome U.S. capital and know-how in developing their own industry. It is the objective of this paper to show how a simple statistical technique can be used in a preliminary sorting of countries into promising and less-promising prospects.

Income Generates Demand

The 1959 World Review issue of PULP & PAPER gave per capita paper consumption figures for 97 countries. The average annual per capita consumption was 48.7 lbs., but it varied all the way from a high of 405.6 lbs. for the U.S. to ½ lb. in Ethiopia and most other of the new states of Africa. What causes these tremendous differences?

We are frequently being told that

*I am indebted to Henry H. Haight, Stanford Research Institute, for computation of the regression equation, which is the basis for most of the discussion in this article. Thomas A. Mainwaring, manager of the forest product and food marketing group, SRI, provided many valuable comments.

TABLE I. Per Capita Consumption of Paper and National Income—48 Selected Countries

Code	Country[1]	Paper Consumption[2] (pounds) Actual (1)	Expected (2)	Net National Product[3] (Per Pound of Paper) (U.S. $) (3)	(4)	Code	Country	Paper Consumption (pounds) Actual (1)	Expected (2)	Net National Product (Per Pound of Paper) (U.S. $) (3)	(4)
1	United States	406	334	$1,870	$4.61	25	Chile	24	55	$ 360	$15.00
2	Canada	280	230	1,310	4.68	26	Portugal	24	25	200	8.33
3	Sweden	222	163	950	4.28	27	Colombia	23	34	250	10.87
4	United Kingdom	198	132	780	3.94	28	Brazil	22	31	230	10.45
5	Switzerland	172	173	1,010	5.87	29	Panama	20	34	250	12.50
6	Denmark	163	126	750	4.60	30	Greece	18	29	220	12.22
7	Norway	158	124	740	4.68	31	Venezuela	13	88	540	41.54
8	Australia	156	164	950	6.09	32	Peru	11	10	120	10.91
9	New Zealand	154	173	1,000	6.49	33	Puerto Rico	11	68	430	39.09
10	West Germany	145	82	510	3.52	34	Egypt	10	10	120	12.00
11	Finland	132	112	670	5.08	35	Guatemala	5	18	160	32.00
12	Belgium	119	136	800	6.72	36	Philippines	8	16	150	18.75
13	France	115	125	740	6.43	37	Turkey	8	27	210	26.25
14	Netherlands	111	81	500	4.50	38	Ecuador	7	16	150	21.43
15	Iceland	93	64	410	4.41	39	Ceylon	5	8	110	22.00
16	Austria	82	56	370	4.51	40	Dominican Rep.	6	18	160	26.67
17	Cuba	72	45	310	4.31	41	South Korea	5	1	70	14.00
18	Japan	69	23	190	2.75	42	Honduras	4	16	150	37.50
19	Israel	59	75	470	7.97	43	Paraguay	4	14	140	35.00
20	Italy	51	45	310	6.08	44	Thailand	2	2	80	40.00
21	Ireland	50	64	410	8.20	45	Republic of Congo	2	1	70	35.00
22	South Africa	50	44	300	6.00	46	India	2	1	70	35.00
23	Argentina	48	73	460	9.58	47	Pakistan	2	1	70	35.00
24	Mexico	29	29	220	7.59	48	Burma	2	0	50	25.00

[1] Only criterion for selection of countries was availability of matched pairs of paper-income data.
[2] *Pulp & Paper*, World Review Number, 1959, p. 7 (consumption figures for 1958).
[3] *Per Capita National Product of Fifty-Five Countries: 1952-1954*, Statistical Papers, Series E, No. 4, United Nations, New York, 1957, Table p. 8-9.

Where are Promising Export Markets? Below the Line. Article Tells Why.

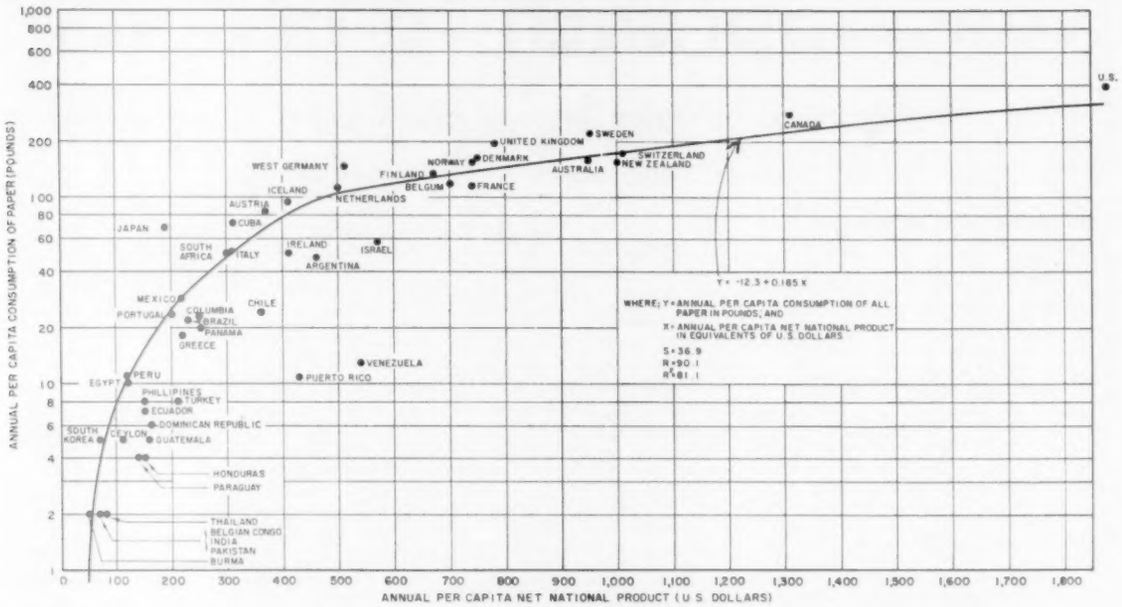

FIGURE I. Association between Per Capita Income and Paper Consumption, 48 Countries

high per capita consumption of paper is a reflection of high levels of living. The larger the material welfare of the people, the more paper used.

We have tried to put a dollar tag on this relationship. In Table I we match 1958 per capita consumption figures with some United Nations data on per capita net national production in 48 countries. Figure I summarizes the findings:

(1) For each extra dollar that a person earns he tends to use about 0.185 lb. paper. In other words, in the 48 countries reviewed, it takes an equivalent of about $5.40 of per capita income to create "demand" for an extra pound of paper.

(2) Per capita income, or level of living, is the most important creator of paper demand. About 81% of the differences (variation) in per capita consumption of paper that existed in 1958 among the 48 countries in our analysis is explained by differences in net per capita income.

In 17 Central and South American countries, if literacy in the population 16 years of age and older increases by 1 percentage point, per capita consumption of paper increases by ⅝ lb. This relationship applies primarily to countries that have literacy of less than 80%. When more than 80% of the people are literate, income becomes the only really good clue to expected demand for paper. Literacy and material level of living go, of course, hand in hand.

How to Use Relationships

Currently, with paper in plentiful supply, many U.S. companies are taking another look at export markets. Which of the many countries with relatively low per capita consumption are the best potential outlets?

Here is how our figures can provide at least an intelligent point of departure.

In the equation in Fig. 1, $Y = -12.3 + 0.185X$. Y = annual per capita consumption of paper in pounds, and X = annual per capita net income in U.S. dollars.

By substituting values for income (X), we can compute the *expected* per capita consumption of paper. For intance, Table I shows $1870 of per capita income in the U.S. So, some 334 lbs. would be "par for the U.S. course" $(-12.3 + 0.185 \times 1870)$. Since the actual consumption was 406 lbs., one can say that we were 72 lbs., or about one-fourth more prodigious consumers of paper than we were entitled to be. The actual and expected rates of paper consumption are listed in columns 1 and 2 in Table I.

Venezuela, Potentially Good Market

With a $540 per capita income we would expect a Venezuelan paper consumption of some 143 lbs.; yet it was actually only about 13 lbs., or less than one-tenth of what income would have indicated. So, relatively speaking, Venezuela looks like an exceedingly promising market for paper. Purchasing power is certainly there. The only trouble might be that the money, much of which comes from oil royalties, is not very equally distributed. Too, paper prices in Venezuela might be quite high. Furthermore, literacy is relatively low.

In Egypt, ancient home of papyrus,

FRANK MEISSNER: "Complementing statistical analysis with expert knowledge of local scene is most challenging intellectual exercise of the decision-maker." Mr. Meissner is a project leader in the General Marketing Research Group of the Stanford Research Institute, Menlo Park, Calif., where his specialties include agricultural economics, food marketing, forest products and packaging. He was formerly head of marketing research for the Distributor Sales div. of Crown Zellerbach Corp. He is a native of Czechoslovakia.

per capita consumption is 10 lbs., only 3 lbs. below Venezuela. Yet with an income of only $120, this is about all the paper we would expect an average Egyptian to be able to "afford." Literacy is also low, of course.

In other words, Egypt is not a very good export market for paper, because the purchasing power and literacy are just not there. As far as income is concerned, the opposite is true for Venezuela; there paper consumption is certainly low because of reasons other than low per capita income.

Looking Ahead

It has already been pointed out that, on average, it takes about $5.40 of net national product per pound of paper. This relationship varies greatly from country to country. Data listed in column 4 of Table I indicate that, in general, the poorer the country the more dollars of per capita national income are needed to generate demand for 1 lb. of paper. For instance, in the U.S. for each $4.61 of national income 1 lb. of paper was consumed. In Egypt it took $12; in Burma, $25.

In other words, illiterate people who make less than, say, $100 a year have little use for paper. They consume less than 10 lbs. per capita annually, which is much less than the theoretical par for the course. However, as soon as a country breaks through the $100 to $150 barest subsistence income barrier, economic development tends to get off the launching pad. Paper consumption starts going up much faster than income.

For instance, Table II shows that in the income range from $100 to $200 the elasticity of demand with respect to income is 4.0. In other words, the regression equation indicates that

TABLE II. Responsiveness of Demand for Paper with Respect to Changes in Net National Product—48 Countries

Net National Income ($/Capita)	Expected Paper Consumption[1] (Pounds/Capita)	Elasticity of Demand with Respect to Income[2]
100	6.2	4.0
200	24.7	1.3
500	80.2	1.1
1,000	172.7	1.0
1,500	265.2	1.0
2,000	357.3	

[1] Table 1 and equation $Y = -12.3 + 0.185 \times$ in Fig. 1.
[2] Percent per capita consumption of paper changes with each 1% change in per capita net national income.

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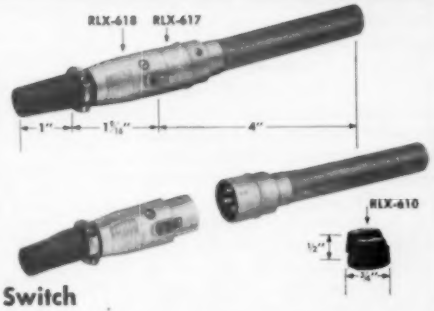

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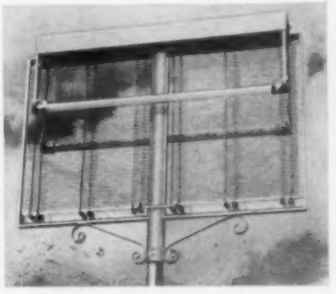

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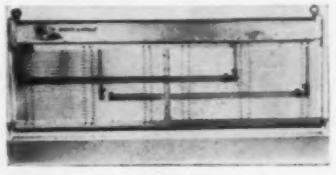

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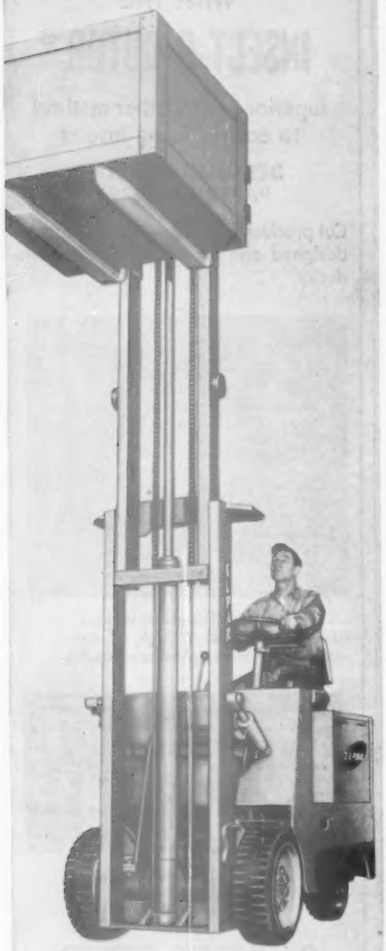

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when per capita net national income goes from $100 to $200 (or 100%) per capita consumption actually tends to quadruple from about 6 to some 24 lbs.

As income increases further, demand elasticity tends to decline. Thus, in the $200 to $500 income range, each 1% boost of income calls for a 1.3% boost in paper consumption.

Finally, in the developed countries —where people average more than, say, $750 annually—the income elasticity falls to about 1.0. This simply means that relative changes in paper consumption are almost identical with changes in national income—a situation which more or less has prevailed in the U.S. and Canada in the last decade or so.

The income elasticity idea provides our statistical analysis with a further refinement. Now we can "sort out" the countries that show much better growth potential in the overall size of the paper market than growth in national product would indicate. In other words, it depends where "below the line" the country is.

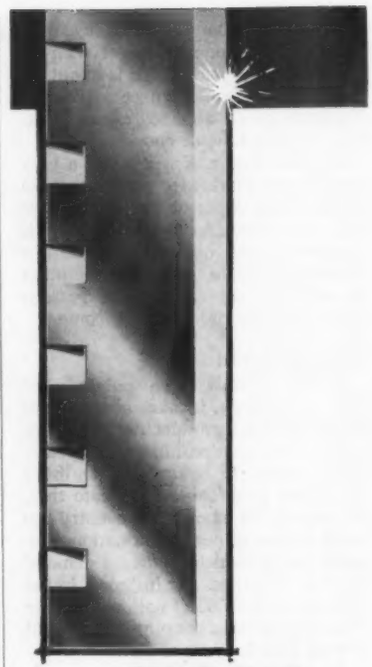
For instance, people in both Ceylon and Guatemala consume about 5 lbs. paper per capita. Yet, with a $110 income, the Ceylonese are still hovering at the subsistence level; on the other hand, with a $160 income, Guatemalans seem to have gotten over the subsistence hump. Thus, every additional dollar of income should generate demand for considerably more paper in Guatemala than an additional dollar would in Ceylon.

Using these criteria one can narrow the field of good potential outlets for paper exports to less than a dozen countries: Turkey, Greece, Brazil, Colombia, Panama, Chile, Guatemala, Puerto Rico, Ireland, Argentina and Venezuela.

It is not meant that other low-consumption countries will never become prodigious consumers of paper. But they will first have to go through a process of "predevelopment," which is a general effort of conditioning people for the takeoff. It implies public investment in areas such as education, health facilities, public transportation, replacement of feudalism by modern legal and social institutions.

Obviously, a private exporter cannot single-handedly undertake such works in order to be able to sell a little extra paper. If such predevelopment efforts are assisted by agencies of the U.S. government or of the United Nations, then an exporter-taxpayer does participate indirectly in building up the potential markets of the future.

Within the decade of the 1960s, somewhere between 10 and 20 nations now classified as underdeveloped probably have a fighting chance to reach



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"self-sustaining growth." This should make them able to continue to expand their economies and to boost levels of living without substantial outside help. A country is generally considered ready for economic "take-off" when over a period of 5 to 10 years overall growth rate in the gross national product has been maintained at about a 5% level, and when annual domestic savings for reinvestment in further growth represent over 10% of GNP. From that point on, needed foreign capital can usually be borrowed from conventional private financial institutions in the world's capital markets.

A Word of Caution

Application of regression analysis and of the income elasticity concept to readily-available data are an extremely helpful first step in an exporter's search for the golden needle in the haystack. This type of analysis has general applicability so that it can be used by exporters anywhere, not just in the U.S. All that is needed are appropriate "raw statistics." To get them is, of course, often the biggest problem.

Yet, the statistical approach alone obviously does not answer all the questions.

For instance, in our analysis we were unable to use prices, because not even remotely comparable data were available for all 48 countries. Yet, prices obviously do influence paper consumption. The next step in the analysis would therefore be an examination of prices in the 10 "chosen" countries. How come that paper prices in, say, Brazil are relatively high in spite of the tremendously rich raw material base of hardwoods in the tropical forests of the Amazon River? Does this point towards great long-range opportunities for American paper companies to participate in the development of these resources? If so, how could it be done? Would it not require a development of new hardwood pulping processes? Could this lead to cheap enough virgin pulp so as to help supply the rapidly-growing needs of the domestic U.S. market? And so the questioning might go.

By now the reader will readily realize that the statistical analysis is merely the beginning of the fun. The really interesting question and answer period comes only after we have pinpointed some potential "nuggets." The job of complementing the statistical analysis with expert knowledge of the local scene is the most challenging intellectual exercise of the decision maker. This holds true for all export commodities, whether industrial or consumer goods.

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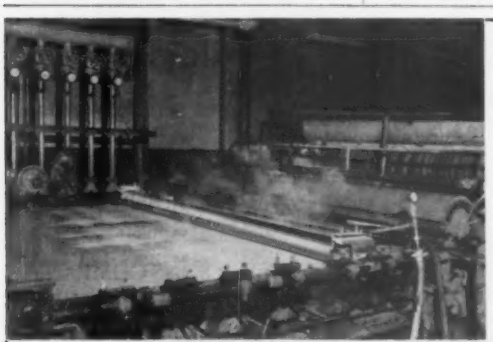

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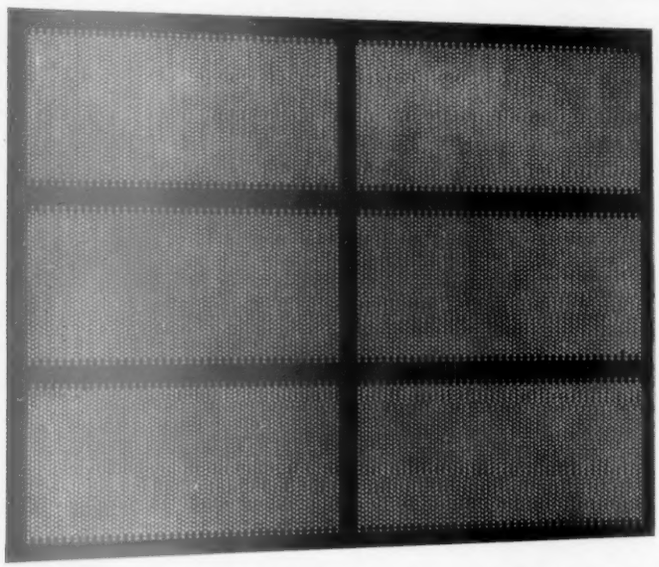

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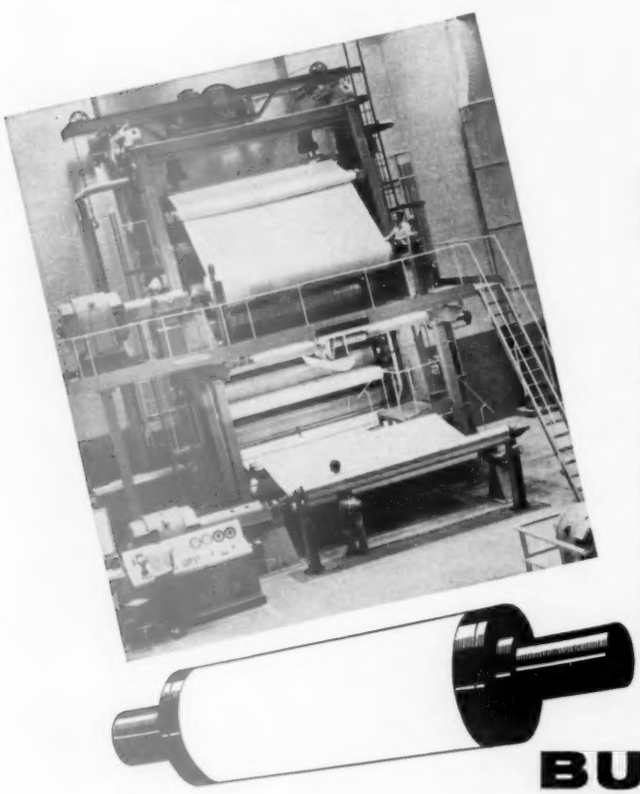

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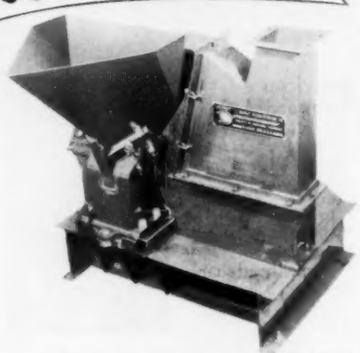

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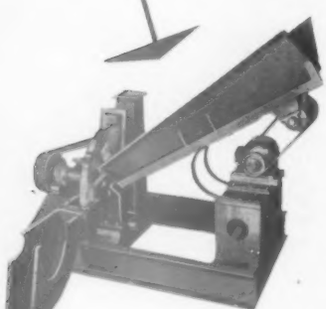

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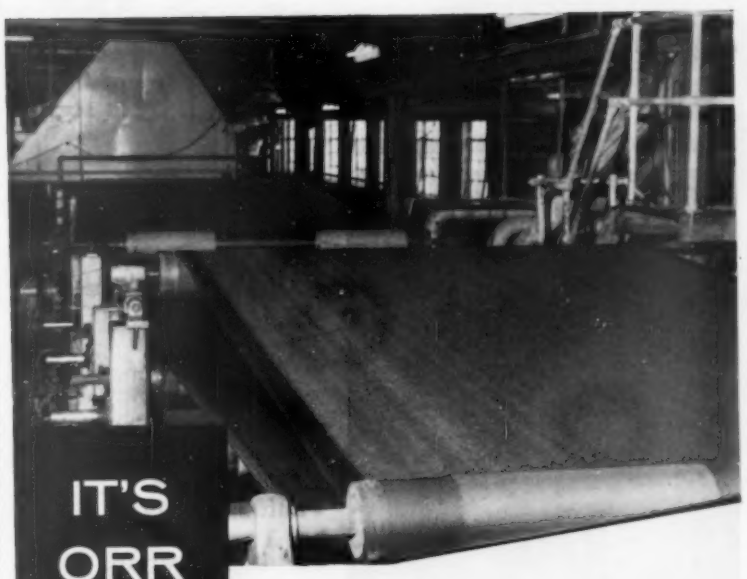

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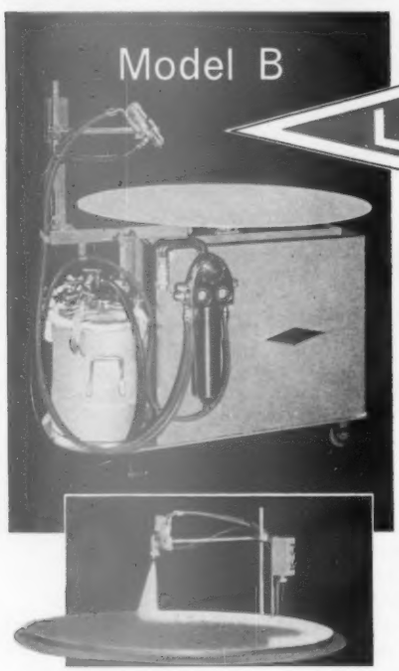

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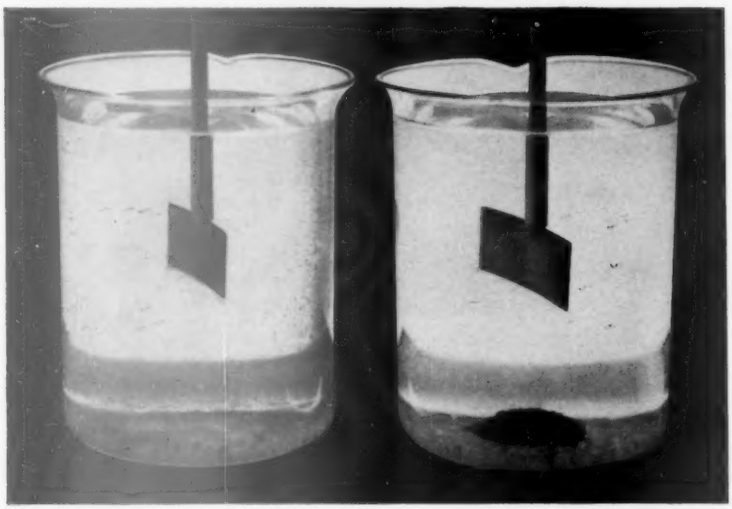

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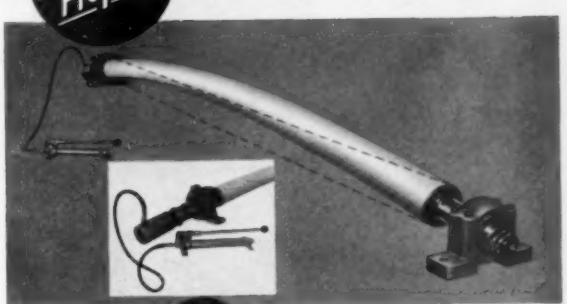

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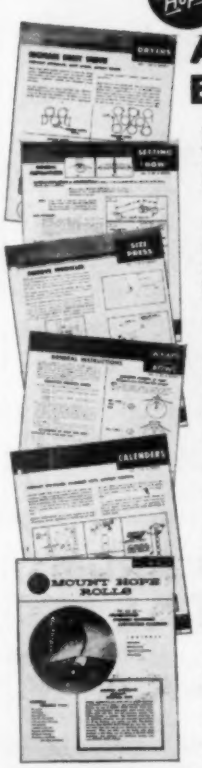

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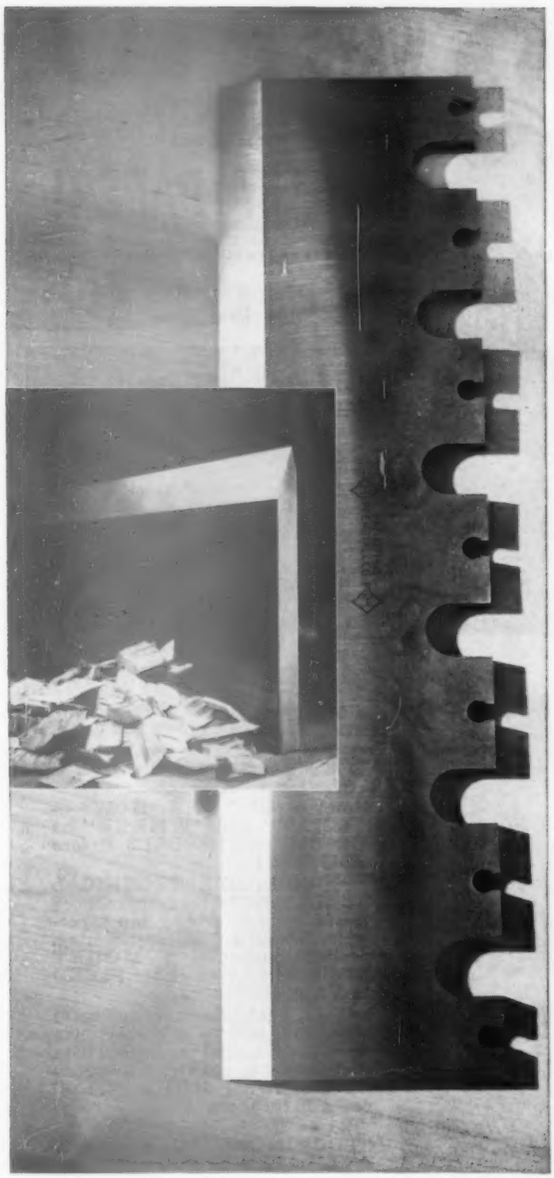

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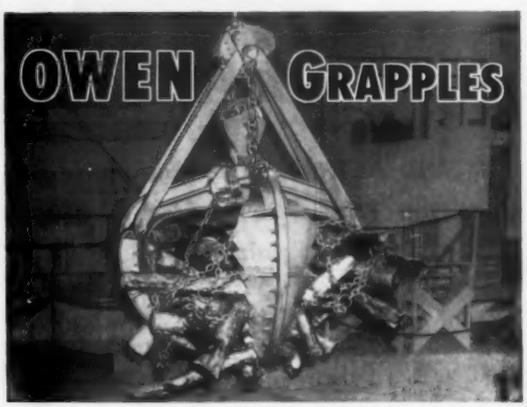

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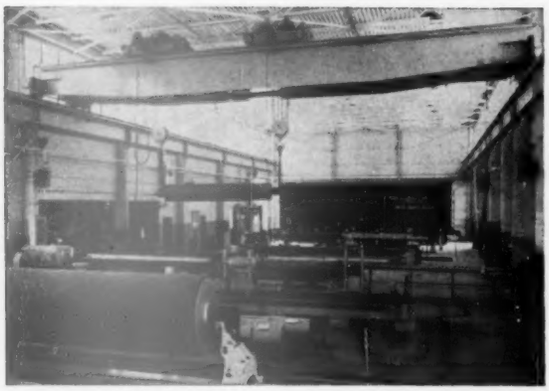

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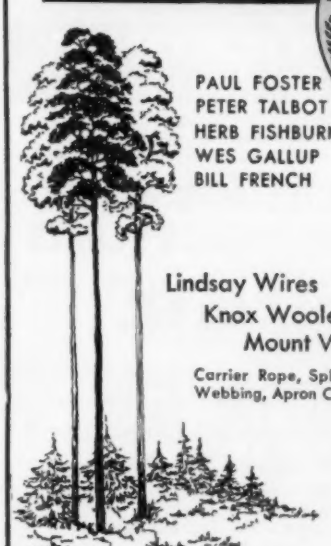

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